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JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

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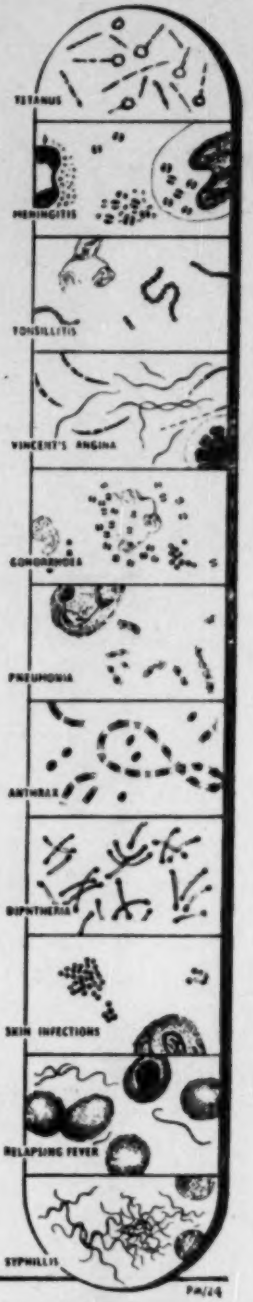

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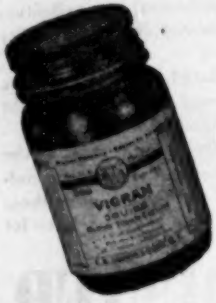

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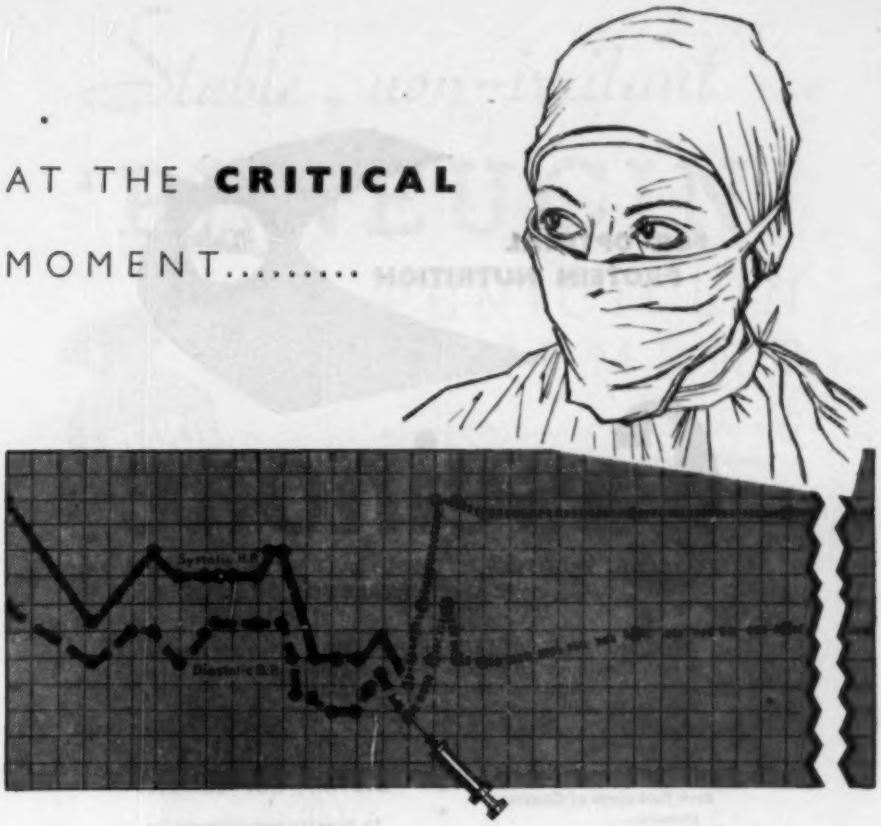

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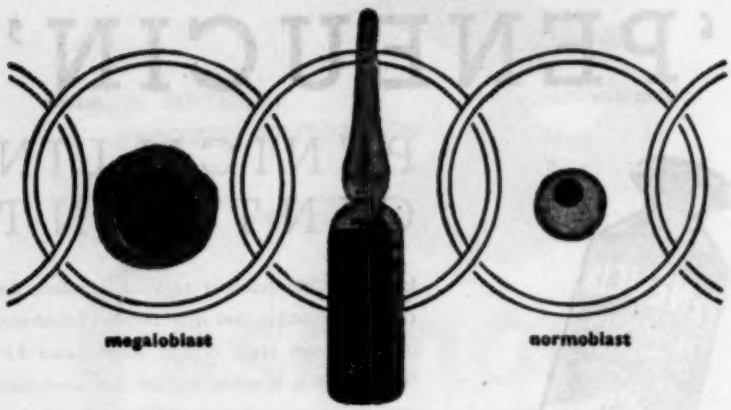

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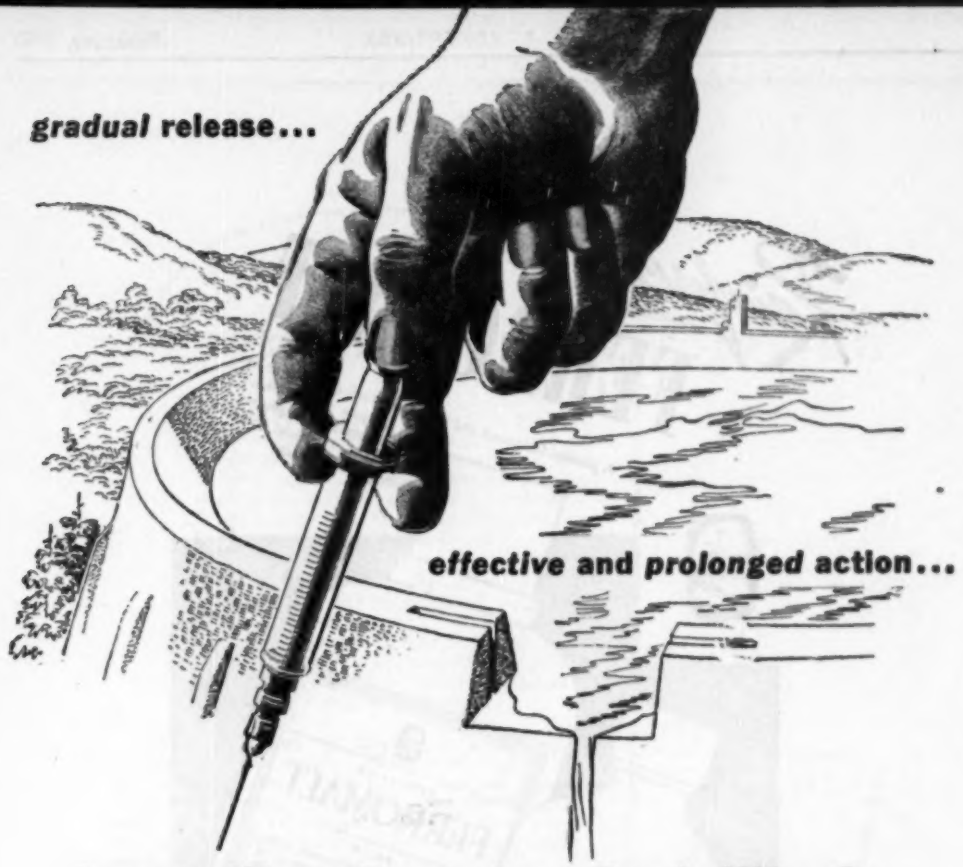

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HETRAZAN (1-DIETHYLCARBAMYL-4-METHYLPIPERAZINE HYDROCHLORIDE) (DIETHYLCARBAMAZINE) IN THE TREATMENT OF FILARIASIS (WUCHERERIA BANCROFTI).

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Hewitt, White, Wallace and Subba Row (1947) made an exhaustive study of the filarial parasite (Litomosoides carinii) in the cotton rat (Sigmodon hispidus), the vector of this parasite being the rat mite (Liponyssus bacoti). The normal variations of micro-filaria were estimated and the counts were done on alternate days, in 8, and every two hours in 4 rats. Counts on alternate days varied from a minimum of 7 to 120 to a maximum of 96 to 675 micro-filaria but when counted every two hours the number varied from a minimum of 0 to 8 to a maximum of 60 to 108 in hundred fields from a thin smear taken from a drop of blood. Weekly microfilarial counts were also done and it was found that considerable fluctuation occurred in the number of microfilariae irrespective of the day or the hour of the count. These counts also showed that in all the rats a marked increase in the microfilariæ occurred after a period of several weeks' of observation, and they concluded that the rats were probably infected with filaria which did not fully mature and subsequently have discharged increasing number of microfilariæ. In only one of their 65 rats they found a spontaneous drop and disappearance of microfilaria.

The adult worms (Litomosoides carinii) were usually present in the pleural cavity and in a few cases in the peritoneal cavity; and when they were in plenty they were found in masses in the pockets between the lobes of the lungs, between the diaphragm and lungs, and over the pericardial membrane or on the outer surface of the lungs. When the worms were removed, the pleural surfaces were normal and in some animals dead worms were found at autopsy and in others they were found in the purulent exudate. In filariasis of dogs (Dirofilaria immitis) the worms that died either naturally or due to the administration of drugs were found in the terminal blood vessels within the lung.

Hewitt *et al* (1947) used 517 organic non-metallic compounds and observed that a compound 180-C (1-carbethoxy-4-methylpiperazine hydrochloride) when administered by mouth or intraperitoneally caused a reduction in the microfilaria in the cotton rat, in all probability due to action on the adult worms. Another drug 'Hetrazan' (1-diethyl-carbamyl-4-methylpiperazine hydrochloride) (84-L) produced better results. From a study of the comparative value of 18 piperazine derivatives they found that hetrazan (84-L) was the drug that showed the maximum effect on the microfilaria. Thirty rats treated with varying doses of 180-C on autopsy showed that most of the adult worms were alive. Nine of the 65 untreated rats showed only one or two dead adult worms. Subsequent observations with hetrazan (84-L) showed the death of the adult filaria after several weeks. The dosage varied from 3-100 mg per kilogram of body-weight, and within two hours of administration of hetrazan all animals showed a reduction of over 90 per cent of circulating microfilaria and complete disappearance after 12 hours in many of the cases. The microfilaria of cotton rats when kept in a solution of hetrazan showed contortions and spasmodic contractions. The action of this drug on the adult worm of the cotton rat could not be demonstrated so clearly as in the case of the microfilaria; and the effect entirely depended upon the dose of the drug, frequency and the interval between the cessation of treatment and autopsy. Untreated rats on autopsy showed dead worms in 13·9 per cent and, those treated with hetrazan showed a few dead or there were no worms at all in 72 per cent. In cases that showed rapid destruction of the microfilaria during the treatment, most of the adult worms were dead at autopsy. In dog, hetrazan produced marked reduction in the number of microfilaria and in 3, many dead worms were found in the terminal blood vessels of the lobes of the lungs. One dog that had a high micro-

filaria count died, and autopsy after two days showed large masses of dead worms completely occluding the pulmonary artery; and it has been suggested that death in these animals was due to the mass migration of worms from the right ventricle into the pulmonary artery.

Hawking and Sewell (1948) during the study of maintenance of filarial infection (Litomosoides carinii) in cotton rats for therapeutic investigations, observed that spontaneous cures occurred in some cases.

Santiago-Stevenson, Oliver-Gonzalez and Hewitt (1947) reported the results of treatment of 26 cases of Wuchereria bancrofti infection with hetrazan. Twenty-three cases were asymptomatic but had microfilaria in the blood; the other 3 had clinical manifestations and microfilariae were present in the night blood. The number of microfilaria were counted before, during and after treatment from the blood taken between 7-45 and 8 P.M. daily. Hetrazan was administered orally 3 times a day, before or after food, the dose varying between 0·5 to 2 mg per kilogram of body-weight and the treatment was continued from 3 to 21 days. In all the cases the number of microfilaria diminished markedly within 48 hours after the commencement of the treatment. The blood smears were negative in 9 within 48 hours and in the remaining 17 the number reduced considerably. Blood from the 8th to 83rd day showed disappearance of microfilaria in 13 cases and low microfilaria counts in the rest. Only one patient that had a microfilaria count of 339, showed a count of 22 on the 75th day of treatment. The toxic reactions commonly observed were fever, headache and general malaise; and the rare ones being nausea, vomiting, painful nodular swellings, joint pains and pain in the testes. Slight leucocytosis with eosinophilia occurred in all the cases except in one during the course of treatment. They further observed that the disappearance of the microfilaria did not depend upon either the amount of the drug or the duration of treatment; and the presence of nodular swellings with leucocytosis, and eosinophilia was suggestive of the death of the parent worm.

Oliver-Gonzalez, Santiago-Stevenson and Malonada (1949) reported the follow-up observations of these 26 cases 15 months after treatment. Out of the 26, only 23 could be examined at the end of 15 months, 13 of the 23 with microfilaria were free from infection at the end of 15 months; and 10 had very low counts which remained persistently low. Patients who showed high filarial counts showed negative smears at the end of 15 months. Only one patient had symptoms while the other 22 were free from symptoms. They concluded that though the microfilaria disappeared from the blood when hetrazan is given in adequate doses in cases of Wuchereria bancrofti infection, the clinical symptoms disappeared only at the end of 15 months.

Hawking and Laurie (1949) observed in a preliminary clinical trial in Tanganyika and Uganda that hetrazan acted like an opsonin, modifying the microfilariae so that they were seized by fixed phagocytes of the reticulo-endothelial system which later destroyed them. The maximum tolerated daily dose was about 20 mg per kg body weight. Small doses of 1 mg per kg body weight twice a day or 0·5 mg per kg 3 times a day removed all the microfilariae from the blood, but 0·2 mg per kg twice a day did not cause the complete disappearance of microfilaria from the blood. Higher doses of 12-20 mg per kg body weight showed that the blood was free from microfilariae in 3 days. Occasionally a few microfilariae were seen up to 3 months. Large doses of 20 mg per kg removed all the microfilariae from the blood in the majority of patients. Experiments on patients showed that when 12 mg per kg was given by mouth, 60-80 per cent of microfilariae disappeared from the blood in half an hour, and when 50 mg was injected intravenously as a single dose, 60 per cent microfilariae disappeared in 4 minutes. When microfilaria (Wuchereria bancrofti) were kept in glucose solution or in hetrazan (200 mg per 100 c.c.) at 37°C they were still active showing that hetrazan has no direct toxic action upon microfilariae. After a week's treatment with 20 mg per kg body weight per day, the microfilariae disappeared from the blood but were still present in the hydrocele fluid. They were observed even when 40 mg of hetrazan was injected into hydrocele fluid. All these observations show that the action of hetrazan is to sensitize the microfilariae for phagocytic action of the reticulo-endothelial system; but if they were in the serous cavities such as pleura, peritoneum, or in the hydrocele fluid, they were not affected by the drug. Hetrazan hydrochloride seems to have better action than hetrazan citrate. The toxic effects of hydrochloride consisted only in nausea, vomiting, especially when given on an empty stomach.

Hawking and Laurie (1949) tried the effect of hetrazan in filariasis (Onchocerca volvulus) and observed the disappearance of microfilariae from the skin but the drug did not kill the adult worms.

Murgatroyd, and Woodruff (1949) tried hetrazan on 17 patients of filariasis (loiasis). The microfilariae disappeared from the blood, the adult worms died and all patients except one remained free from symptoms for 1 to 14 months after the treatment.

Hewitt and Hardy (1949) conducted mass treatment by hetrazan in St. Croix, Virgin Islands. Different doses were adopted, 100 mg tablets for adults and 50 mg tablets for children. The drug was given daily once for 5 days in 11 cases with 90·7 per cent reduction in microfilarial count; 3 times a day for 3 days in 39 cases with a reduction of 89·8 per cent of microfilaria; 3 times a day for 5 days in 19 cases with a reduction of 89·5 per cent, and 3 times a day for

7 days in 36 cases with a reduction of 96·2 per cent of microfilarial count.

Preliminary observations by Kennedy and Hewitt (1949) on chronic and advanced cases of infection with W. bancrofti showed that subjective symptoms and lymphadenitis were reduced and they advocated a minimum of four weeks' treatment in advanced cases.

Stoll (1947) showed that hetrazan has got a highly specific and rapid effect on Onchocerca volvulus

Pharmacology of Hetrazan

Hetrazan (1-Diethylcarbamyl-4-Methylpiperazine hydrochloride) or 84-L has a molecular weight of 234·6.

It is a colourless crystalline substance soluble in water, alcohol, and chloroform but insoluble in benzene, ether, and petroleum ether. The pH of a 1 per cent solution is 4·1. The drug is mainly eliminated by the kidneys but the form in which it is excreted is yet to be determined. But it is suggested that it is excreted unchanged.

Harned *et al* (1948) estimated the toxicity of hetrazan in experimental animals by (1) convulsive and (2) fatal dose. The convulsive dose was considerably low when compared with the fatal dose. In rats and mice the lethal dose administered varied, intravenously from 82 to 152 mg. per kg. of body weight, intraperitoneally 248-465 mg., and orally 660-1280 mg. per kg. body weight. In guineapigs administration of 50 mg. per kg. of body weight, intraperitoneally did not show any symptom. In cats, 50 mg. intraperitoneally per kg. of body weight produced toxic symptoms and in dogs 100 mg. intraperitoneally per kg. of body weight produced only slight reaction and when given orally 25 mg. per kg. of body weight it was retained and when it was increased to 50 mg. emesis occurred.

Repeated administration of hetrazan intraperitoneally of 300 mg. per kg. of body weight showed convulsions in all the animals after the first dose but administration of 100 mg. at the end of two hours did not produce any convulsion. But after the 3rd and 4th dose, 9 per cent and after the 8th dose 45 per cent showed convulsions. Rate of excretion was about 100 mg. per kg. of body weight per hour. The drug is usually eliminated by the kidney, but the exact form in which it is excreted is not known. In rats the drug was excreted unchanged. As regards the action upon the other systems it acted only as a mild diuretic or analgesic.

Action of Hetrazan

The mode of action of hetrazan is not definitely known. It may act on the adult or microfilaria. Hewitt *et al* (1947) observed a large number of attenuated or distintegrated adult filaria in the pleural cavity after treatment. Living or dead embryos were found in the uterus. Dead or decayed worms were found enveloped in the caseous and purulent material and in some cases there were no worms at all. In these cases it was assumed that the dead worms were reabsorbed. In all the cases of the present series microfilaria practically disappeared from the blood showing thereby that the drug has got a definite action on the microfilaria. Whether this action is direct or indirect is not certain. Only three cases showed tenderness and swelling at the original site of infection, and it may be assumed that in these cases the adult filarial worms were killed by hetrazan. Subcutaneous nodular swellings occurred in the arms in one case showing the death of the adult worm. In the two cases of chyluria, microfilaria disappeared from the blood and in one case, chyluria also disappeared and this occurred within 48 hours of administration of the drug.

All authors agree that hetrazan causes the disappearance of microfilaria from the peripheral blood, either directly, or indirectly by the death of the parent worm. Symptoms are not usually affected in advanced cases, but improvement occurs in early clinical manifestations. Further alteration or addition to the drug may be required to make it an efficient drug in the treatment of filariasis. Mass treatment by hetrazan may be used as a prophylactic since it destroys the microfilaria in the peripheral blood.

Case Reports

Seven cases were admitted under the senior author and treated with hetrazan. Abstracts of these cases are given below:

Case 1—K. V. Male, aged 33 years, was admitted on 7-10-48 with a history of abdominal pain of two months' duration. Six years ago he suffered from an attack of fever which lasted for 4 days. The present complaint started 5 weeks ago with symptoms of diarrhoea and occasional passage of mucus. He was treated on the surgical side with sulphathiazole for 6 days. The night blood showed microfilaria and he was transferred to the wards of the senior author.

Physical examination revealed an emaciated individual with sunken eyes, with dry and coated tongue, liver was palpable 3 fingers breadth below the costal margin and was tender. No other masses were felt in the abdomen; scrotum and testes were normal. There was no oedema, no fever. *Urine* showed only phosphates, otherwise normal. *Stool* examination showed strongyloides stercoralis larva and a few degenerated leucocytes. *Blood*: R.B.C. 2·7 million. W.B.C. 7,600. Hb. 60 per cent., Poly 46; Lympho 42; Mono 4 and Eosino 8 per cent; Sedimentation rate 12 mm. per hour. Blood urea: 37 mg per 100 c.c. Van den Bergh reaction: both direct and indirect negative. Night blood showed plenty of microfilaria. A preliminary microfilarial count was done to find out the normal daily variation. This was done by taking 20 c.mm. of blood and it was spread on the slide, dehaemoglobinised and stained and the number of microfilaria were counted. The results are given below (Table 1). The average count was 77 microfilaria per 20 c.mm. of blood. He was started on hetrazan 25 mg. 3 times a day on 27-10-48.

TABLE I—SHOWING THE MICROFILARIA COUNT IN THE BLOOD BOTH BEFORE AND AFTER HETRAZAN

	Date	Amount of drug	Number of microfilaria in 20 c.mm. of blood	Remarks
	1948			
Before treatment	10-10	Nil	90	
	13-10	..	65	
	15-10	..	64	
	17-10	25 mg. t.d.s.	89	Developed fever in the evening 100°F.
During treatment	27-10	do		
	28-10	do	66	Fever and pains all over the body. 100°F. Pulse normal.
	29-10	do	40	Temperature settling down.
	30-10	do	18	Temperature 100°F. W.B.C. 7,600. P. 75, E 10, L 12, and M 3%.
	31-10	do	12	Temperature normal.
	1-11	do	4	do
	2-11	do	4	W.B.C. 8000 Hb 55%, P. 72, E 10, L 15, M 3%.
	3-11	do	6	
	4-11	do	6	
	5-11	do	6	
	6-11	do	3	W.B.C. 8400, Hb 50%, P. 50, L 26, M 6, E 18%.
	7-11	do	6	
	8-11	do	7	
	9-11	do	7	
	10-11	do	3	
	11-11	do	2	
	12-11	do	2	
	13-11	do	2	W.B.C. 8000, P. 45, L 28, M 6 and E 21%.
	14-11	do	2	
	15-11	do	Nil	
	16-11	do	3	
	Hetrazan was stopped and he had 1575 mg. in 21 days.			
	17-11		1	
	18-11		Nil	
	19-11		Nil	
	21-11		Nil	One c.c. of blood was added to 10 c.c. of 1% formalin and centrifugalised and the number of microfilaria counted. Few M.F. were seen.
	22-11		Nil	½ c.c. of blood was treated as above. M.F. few.
	24-11		Nil	½ c.c. of blood was treated as above. M.F. 1.
	25-11		Nil	½ c.c. of blood was treated as above. M.F. Nil.
	7-12		Nil	½ c.c. of blood was treated as above. M.F. Nil.

Patient improved very much in health and has put on 12 pounds in weight. He was discharged on 23-12-48.

Summary: A case of filariasis with heavy infection of microfilaria in the night blood but without any clinical manifestations, treated with 25 mg (0·71 mg per kilogram of body weight) of hetrazan three times a day. The patient had on the whole 1575 mg. of hetrazan in 21 days. Microfilaria disappeared but an occasional microfilaria was observed when large quantities of blood varying from ½ to 1 c.c. of night blood was examined. There was definite increase of eosinophil cells from 10 to 21 per cent after treatment.

Case 2—K.S. Male, aged 60, was admitted on 21-10-48 with a history of chyluria of one month's duration. He had occasional attacks of filariasis since 1906 and used to have high fever associated with sweats lasting for about 4 days. Later oedema of the scrotum and testicular enlargement appeared. In 1923 he was operated for hydrocele and the fluid was milky

(chylocele). During the last three years he was observing chyluria now and then for about a day and for the last one month it was persistent. *Physical examination* showed a well nourished individual without any oedema or anaemia. There was no fever. Scrotum was elephantoid and epidydimis was involved. Heart was enlarged and blood pressure was 178/125 mm. of Hg. Other systems were normal. *Urine* was milky and contained microfilaria. Fundus oculi was normal. *Blood*: R.B.C. 3·5 million., W.B.C., 6800. Hb 70 per cent. Poly 34, Lympho 16, Eosino 48 and Mono 2 per cent. Blood urea 38 mg. Sedimentation rate, 20 mm. per hour. Night blood showed microfilaria. The count (Table 2) was done as in the previous case and he was started on hetrazan 25 mg. three times a day on 27-10-48.

TABLE II—SHOWING THE MICROFILARIA COUNT BEFORE AND AFTER THE ADMINISTRATION OF HETRAZAN

	Date	*Amount of drug*	*Number of microfilaria in 20 c.mm. of blood*		*Remarks*
	1948				
Before treatment	22-10	Nil	15		
	25-10	..	14		
	26-10	..	12		
During treatment	27-10	25 mg. t.d.s.	14	Urine	Temp. 99·5°F. with rigor and pain
	28-10	do	22	Chyle + Urine Chyle + M.F. +	right testes.
	29-10	do	14	Chyle + M.F. Nil	Fever came down. Clots in urine.
	30-10	do	12	Chyle + M.F. Nil	Temp. normal. Pain in testes less. W.B.C. 6200, Hb 60%, P. 64, E 24, L 10 and M 2%.
	31-10	do	8	do	Temp. normal.
	1-11	do	4	do	
	2-11	do	2	do	W.B.C. 6400, Hb 55%, P. 62, E 26, L 10 and M 2%.
	3-11	do	4	do	
	4-11	do	4	do	
	5-11	do	2	do	
	6-11	do	2	do	W.B.C. 6400, Hb 55%, P. 62, E 26, L 10 and M 2%.
	7-11	do	2	do	
	8-11	do	1	do	Temp. normal.
	9-11	do	2	do	Cholesterol 239·4 mg. %.
	10-11	do	1	do	
	11-11	do	3	do	
	12-11	do		do	
	13-11	do		do	
	14-11	do	1	do	
	15-11	do	Nil	do	
	16-11	do	Nil	do	½ c.c. of blood was added to 10 c.c. of formalin and centrifugalised. M.F. few.
	A total of 1575 mg. was given in 21 days.				
After treatment	17-11	Nil	Nil		M.F. few in ½ c.c. of blood treated as above.
	18-11	Nil	Nil		do
	20-11	..	Nil		do W.B.C. 7000, R.B.C. 3·8 million, Hb 80%.
	21-11	..	Nil		½ c.c. of blood treated as above. No M.F. in urine which contained chyle.
Patient was discharged on 21-11-48, chyluria still persisted but microfilaria disappeared from the urine.					
	9-12	..	Nil		½ c.c. of blood treated as above showed occasional M.F.

He had later fever with rigor and was seen again in March 1949. Chyluria still persisted but blood did not show any microfilaria.

Summary: A case of filariasis with involvement of scrotum, chyluria and the presence of microfilaria in the night blood. He had hetrazan 25 mg 3 times a day (0·45 mg per kilogram of body weight) and on the whole 1575 mg in course of 21 days. Microfilaria gradually disappeared and only few microfilaria could be seen after treatment, in ½ c.c. of blood when centrifugalised with formalin, but chyluria still persisted. An original blood count of 48 per cent eosinophilia came down to 26 per cent after treatment.

Case 3—K.S. Male, aged 26 years, was admitted on 22-11-48 with abdominal pain of two years duration. He had filarial fever 1½ years ago with microfilaria in night blood. The present attack started with pain in the lower abdomen especially after exertion and had the last attack about a fortnight ago. He had no fever but night blood showed microfilaria. *Physical examination* showed right inguinal hernia and enlarged and tender epidydimis. There were no other symptoms. *Blood pressure* 120/90 mm. of Hg. *Urine* normal. *Blood* (24-11-48): R.B.C. 5 million. Hb 75 per cent, W.B.C.: Poly 70, Lympho 20, Eosino 6, and Mono 4 per cent. Subsequent blood counts showed variations of polymorphs from 20-45; Eosino 30-53; Mono 5-16 per cent. He had on an average 40 microfilaria in 20 c.mm. of night blood (Table 3) and hetrazan was started on 26-11-48.

TABLE III—SHOWING MICROFILARIA COUNT BEFORE AND AFTER HETRAZAN IN CASE 3

	Date	*Amount of drug*	*Number of microfilaria*	*Remarks*
	1948			
	24-11		20 in 25 c.mm.	
Before treatment	25-11			
During treatment	26-11	50 mg. t.d.s.	20 do	
	27-11	do	25 do	Patient complained of feverishness, pains all over the body, pain and swelling left testicle causing him sleeplessness.
	28-11	do	5 do	Temp. 100·5°F. left epidydimos swollen and very tender.
	29-11	do	3 in 80 c.mm.	General condition same as above. Temp. 100·4°F. Complained of aches etc.
	30-11	do	1 in 40 c.mm.	Temp. normal. General improvement. Epidydimitis subsided.
	1-12	do		
	2-12	do	4 do	Temp. continued to be normal; general condition normal.
	3-12	do	2 in 40 c.mm.	Temp. normal.
	4-12	do	2 do	
	5-12	do	2 do	
	6-12	do	.. ..	
	7-12	do	Nil	Headache
	8-12	do	do	
	9-12	do	do	do
	10-12	do	do	do
	11-12	do	.. ..	
	12-12		.. ..	
No Hetrazan	13-12	Nil	do	Hetrazan discontinued due to persistent headache.
	14-12	Nil	do	½ c.c. blood in 10 c.c. of 1% formalin. No M.F.
	15-12	Nil	do	do
	16-12	Nil	Few	½ c.c. blood treated as above showed few M.F. Hetrazan continued.
	17-12	50 mg. t.d.s.	.. ..	
	18-12	do	.. ..	
	19-12	do		
	20-12	do		
	22-12	Nil	Few	½ c.c. blood treated as above showed an occasional M.F.

The patient improved and put on weight.

Summary: A case of filariasis of 1½ years' duration associated with fever, and epidydimitis, treated with 50 mg (1·08 mg per kilogram of body weight) of hetrazan three times a day. Treatment was continued for 21 days with a slight interruption for 4 days and he had on the whole 3150 mg. The microfilaria gradually disappeared but a few microfilariae were observed even in ½ c.c. blood. Symptoms also disappeared in addition to disappearance of microfilaria from the blood.

Case 4—V.A. Male, aged 18 years, was admitted on 23-12-48 for frequent attacks of lymphangitis of two years' duration. During the second attack, one year ago, an abscess developed bnt it healed. Six months later he had another attack which again resulted in an abscess; and the last one he had a month ago with lymphangitis. *Physical examination* showed nothing abnormal except enlarged glands of the groin on both sides; scrotum and testes and epidydimis were normal. Night blood showed 90 microfilaria per 20 c.mm. (average for three days). *Blood*: R.B.C. 4·1 million. Hb 80 per cent. W.B.C. 7000. Poly 68, Eosino 16, Iympho 14 and Mono 2 per cent. *Blood urea* 46 mg. and cholesterol 172·4 mg. per 100 c.c. The patient was started on hetrazan 50 mg t.d.s. Four days later microfilarial rate came down rapidly to 4 per c.mm., there was no rise of temperature but right inguinal glands became painful and tender. Microfilaria disappeared on 5-1-49. ½ c.c. of blood in 1 per cent formalin showed on centrifugalisation only one microfilaria. On 17-1-49 hetrazan was stopped after a course of 21 days and ½ c.c. of blood showed only occasional microfilaria. Leucocyte count after treatment on 17-1-49 showed W.B.C. 7600, Poly 65, Eosino 19, Lympho 13 and Mono 3 per cent. The patient had on the whole 3150 mg of hetrazan. He was followed up for three months. Microfilarial counts done once a month showed only occasional microfilaria in ½ c.c. of blood and he was discharged on 18-1-49.

Summary: A case of filariasis of two years' duration with recurrent attacks of abscess formation and he had in addition filarial lymphadenitis of the groin. Hetrazan 50 mg t.d.s. (1·14 mg per kilogram of body weight) caused disappearance of microfilaria, and after 3150 mg only an occasional microfilaria was observed in ½ c.c. of blood.

Case 5—T.S. Male, aged 20 years, was admitted on 5-1-49 for chyluria and frequent attacks of lymphangitis of one year's duration. *Physical examination* showed swelling of the left testes, spermatic cord and epidydimis, and enlarged and tender inguinal glands. There was no fever. Other systems normal. Chyle was present in all the specimens of urine and showed under microscope granular casts, r.b.c. leucocytes and microfilaria. Night blood showed an average count of 20 microfilaria per 20 c.mm of blood. *Blood*: R.B.C. 3·8 million. Hb 70 per cent., W.B.C. 15,200. Poly 77, Lympho 5, Eosino 13 and Mono 5 per cent. Blood uren 48 mg and cholesterol 294 mg per 100 c.c. Hetrazan was started on 8-1-49, 50 mg three times a day. After 48 hours he leveloped a temperature of 101°F. No other toxic symptoms occurred. The temperature remained only for one day but the chyluria still persisted. Within 48 hours of hetrazan night blood showed only 3 microfilaria in 20 c.mm and microfilaria disappeared in urine, but chyluria still persisted. The only abnormality that could be observed in the urine was change in the intensity of opacity. On the 13th day of the treatment after 1800 mg. of hetrazan, chyulria disappeared and night blood showed occasional filaria in ½ c.c. blood. Blood count after treatment: W.B.C. 11,500. Poly 63, Lympho 15, Eosino 20 and Mono 2 per cent.

Summary: A case of filariasis with chyluria, lymphangitis and involvement of the spermatic cord, epidydimis and testes. He had 50 mg of hetrazan (1·4 mg per kilogram of body weight) three times a day and had on the whole 3150 mg in 21 days. After 1800 mg., chyluria disappeared and finally only an occasional microfilaria could be seen in ½ c.c. of blood.

Case 6—T.B. Male, aged 26 years was admitted on 6-1-49 for filarial infection of 3 year's duration. The present complaint started 4 months ago and a low temperature was persistent for nearly 50 days, normal in the morning and 101°F. in the evening. He had in addition involvement of the scrotum and the testes and spermatic cord. After demonstration of microfilaria in night blood he was treated outside with sulphanilamide and penicillin. Later he had rise of temperature and pain in the right scrotum. Another course of sulphanilamide gave relief. Fifteen days later the temperature again shot up with involvement of the right testes, and was relieved by penicillin.

Physical examination after admission to hospital did not reveal any abnormality. The scrotum and testes and epidydimis were normal. Night blood showed 6 microfilaria in 20 c.mm of blood (average count for six days). Blood: R.B.C. 6 million, W.B.C. 19,000. Hb 90 per cent. Poly 70, Lympho 25, Eosino 2 and Mono 3 per cent. Blood urea 48 mg and cholesterol 233 mg per 100 c.c. Urine was normal.

Hetrazan was started on 9-1-49, 150 mg three times a day, and 48 hours later the number of microfilaria was reduced to 2 per 20 c.mm. of blood. But he developed subcutaneous nodular swellings in the right arm. Temperature was normal. Microfilaria was reduced to one in 20 c.mm. two days later. This time there was pain and tenderness of the right testes. He was discharged on 15-1-49 and the treatment was discontinued from 25-1-49. He had on the whole 7200 mg. of hetrazan. Night blood after the end of treatment did not show any microfilaria in ½ c.c. of blood. Second blood count showed Poly 68, Lympho 22, Eosino 6 and Mono 4 per cent. The patient was followed up and a month later he developed fever and

lymphadenitis of the left groin but blood did not show any microfilaria.

Summary: A case of filariasis with involvement of the testes, spermatic cord and lymphadenitis of the groin. He was given 150 mg. of hetrazan three times a day (2·2 mg per kilogram of body weight) for 16 days and he had on the whole 7,200 mg. The original blood count of 20 microfilaria in 20 c.mm of blood was reduced to 3 in the course of 48 hours and later only occasional microfilariæ were oobserved in ½ c.c. of blood. Examination a month later showed complete disappearance of microfilaria.

Case 7—S.C. Male, aged 40 years, was admitted on 3-2-49 for pain in the right testes of 4 days' duration. He used to get milder attacks previously. Physical examination showed only slight tenderness of the right testes; other systems were normal. Night blood showed an average of 3 microfilaria in 20 c.mm. of blood. Blood: R.B.C. 4·2 million. W.B.C. 4,000. Poly 58, Lympho 32, Eosino 6 and Mono 3, and Baso 1 per cent. Blood urea 25 mg per 100 c.c. Patient was started on hetrazan on 13-2-49, 100 mg. three times a day. Three days later microfilaria disappeared from the blood and the patient complained of pain in the right testes; it was slightly swollen. There was no febrile reaction. Later on blood was examined daily and even ½ c.c. of blood did not show any microfilaria. The patient had on the whole 6,300 mg. of hetrazan in 21 days.

Summary: A case of filarial epidydimitis and orchitis showing microfilaria in night blood was treated with hetrazan 100 mg. (2 mg. per kilogram of body weight) three times a day, for a period of 21 days. Microfilaria disappeared in 3 days' time. But there was slight swelling of the testes. At the end of treatment there were no symptoms and microfilaria disappeared.

These cases are being followed up and their condition will be reported later.

Discussion

Examination of Blood for Microfilaria—Blood was examined in all the cases between 12 P.M. and 1 A.M. (midnight). Twenty c.mm. of blood was taken in a pipette and spread on a slide, a thick smear was made, it was dehaemoglobinised, and the number of microfilaria counted. When no microfilaria could be observed in 20 c.mm. of blood, ½ to 1 c.c. of patient's blood was taken and it was mixed with 10 c.c. of 1 per cent formalin, centrifugalised and was examined for microfilaria. In some cases although microfilaria disappeared in 20 c.mm., an occasional microfilaria could be seen in ½ to 1 c.c. of the centrifugalised specimen of blood.

Seven cases of filarial infection by Wuchereria bancrofti were treated with 75-450 mg. (0. 45 to 2·2 mg. per kilogram of body weight) of hetrazan daily for a period of 21 days. Case 1 was symptomless and had on the average 77 microfilaria in 20 c.mm. of blood. He had 25 mg. (0·71 mg. per kilogram) three times a day and had on the whole 1575 mg. of hetrazan. At the end of treatment microfilaria practically disappeared with only an occasional microfilaria in ½ to 1 c.c. of the blood. Case 2 had filarial fever, hydrocele, epidydimitis, orchitis and chyluria. Night blood showed on an average 14 microfilaria in 20 c.mm. of blood. Microfilaria were also present in chylous urine. Hetrazan was given 25 mg. (0·45 mg. per kilogram of body weight) three times a day for 21 days and had on the while 1575 mg. At the end of treatment, although microfilaria disappeared from the blood, chyluria still persisted but the microfilaria in the urine disappeared. Occasional microfilaria was observed in ½ c.c. of blood. Case 3 had involvement of the scrotum and testes; night blood showed 40 microfilaria in 20 c.mm. of blood. He had hetrazan 50 mg. (1·08 mg. per kg. body weight) three times a day for 21 days with slight interruption of four days and had on the whole 3150 mg. After treatment epidydimitis subsided and microfilaria gradually disappeared but a few were observed in ½ c.c. of blood. Case 4 had frequent attacks of lymphangitis for 4 years with abscess formation and had filarial lymphangitis of the groin. Blood showed an average of 90 microfilaria for 20 c.mm. of blood. Hetrazan, 50 mg. (1·14 mg per kilogram) three times a day was given and he had on the whole 3150 mg. After treatment microfilaria rapidly disappeared but still an occasional one was observed in ½ c.c. blood. Case 5 had chyluria of one year's duration and lymphangitis, lymphadenitis, orchitis and epidydimitis. Night blood showed on an average, 20 microfilaria in 20 c.mm. of blood. He had hetrazan for 21 days, 50 mg. (1·4 mg. per kilogram) three times a day, and had on the whole 3150 mg. At first urine showed slight decrease in the opacity, but finally chyluria disappeared, but night blood showed only occasional microfilaria. Case 6 had filarial fever and involvement of scrotum and testes and spermatic cord previously before admission to hospital. Night blood showed 6 microfilaria in 20 c.mm. of blood. He had hetrazan 150 mg. (2·2 mg. per kilogram) three times a day for 16 days and had on the whole 7200 mg. Microfilaria practically disappeared from the blood but an occasional one was seen in ½ c.c. of blood. Case 7 had epidydimitis and orchitis. Night blood showed on an average 3 microfilaria for 20 c.mm. of blood. He was started on hetrazan 100 mg. (2 mg. per kilogram) three times a day, for 21 days and on the whole he had 6300 mg. At the end of treatment symptoms disappeared and there were no microfilaria in the night blood.

TOXIC SYMPTOMS—*Fever* was present in 4 cases and varied from 99 to 101°F. Usually it lasted for only two days and in one case it was present for 4 days.

Headache was present in 3 cases and in one case treatment had to be interrupted for 4 days due to the severity of headache.

Pain all over the body was present in 4 cases and all of them had fever.

Pulse and respirations did not show any abnormality except that of corresponding rise with the rise of temperture.

Increased pain and tenderness of the testes was present in all three cases that showed involvement of the testes and epidydimis before treatment.

Subcutaneous nondular swellings occurred in one case during the course treatment.

DISCUSSIONS

DISAPPEARANCE OF MICROFILARIA—The following table gives the rate of disappearance of microfilaria after hetrazan:

DISAPPEARANCE OF MICROFILARIA

Case No.	*Before treatment No. of M.F.*	*Total Hetrazan mg.*	*After treatment No. of M.F.*
1	77	1575	Occasional
2	14	1575	One
3	40	3150	Occasional
4	90	3150	Occasional
5	20	3150	Occasional
6	20	7200	Nil
7	3	6300	Nil

Case 4 had the maximum average count, before treatment and it varied form 64 to 90 per 20 c.mm. of blood.

Daily variations of microfilaria in two cases are as follows:—

	Case (1) (Hetrazan 0·71 mg. per kg.) Microfilaria in 20 c.mm. of blood		Case (2) (Hetrazan 0·45 mg. per kg.) Microfilaria in 20 c.mm. of blood	
Day	*Before treatment*	*During treatment*	*Before treatment*	*During treatment*
1	90		15	
2	65		14	
3	64		12	
4	89			14
5		66		22
6		40		14
7		18		12
8		12		8
9		4		4
10		4		2
11		6		4
12		6		4
13		6		2
14		3		2
15		6		2
16		7		1
17		7		2
18		3		1
19		2		3
20		2		Nil
21		2		Nil
22		2		Nil
23		Nil		1
24		3		Nil
25		Nil		Nil

The fall was observed up to the 5th day and it was rapid, then later there was a constant low figure, varying from 0-6 microfilaria. A similar fall was observed in the other case also. In Case 3 the fall was rapid during 48 hours and from 40, it came down to 5, and when no microfilaria were ovserved in 20 c.mm. of blood, ½ to 1 c.c. of blood was added on to 1 per cent formalin, centrifugalised and the deposit was examined for microfilaria. This method showed an occasional microfilaria in three cases. When the dose was increased to 300—400 mg. (2 to 2·2 mg. per kilogram of body weight) per day the microfilaria disappeared rapidly, and only few could be observed after 48 hours.

SUMMARY

1. Literature on hetrazan in the treatment of filariasis is reviewed.

2. Seven cases of filariasis (W. bancrofti) were treated with hetrazan.

3. The dose varied from 25 to 150 mg. (2·2 mg. per kilogram of the body weight) three times a day and continued for 21 days. In one case it was given only for 16 days.

4. Clinical symptoms such as epidydimitis and orchitis disappeared, but chyluria persisted in one case and disappeared in another.

5. Microfilaria practically disappeared from the blood in all the cases and the fall was rapid up to the 5th day and later a low and constant number was observed. In two cases where the dose was increased to 2·2 mg. per kilogram of body weight rapid fall occurred in 48 hours.

6. Toxic symptoms observed were, fever, headache, pains all over the body, increased pain and tenderness in testes and subcutaneous nodular swelling.

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IDIOPATHIC DETACHMENT OF RETINA*

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Detachment of retina is a technical subject of ophthalmology. A justification is required in talking about it to the general practitioners. It has been the writer's experience that many patients seek the advice of their family physicians or doctor friends when an operation is advised in this condition. Two cases are known who refused operation and went blind in the affected eyes, as their own doctors and doctor friends informed them that the operation in this condition does not succeed. A lawyer, who had detachment in his only effective eye, was advised operation by three eye surgeons. He agreed to the operation after his doctor friend, a specialist in obstetrics and gynæcology, advised him to get the eye operated. He recovered his normal vision after operation.

Idiopathic detachment is one in which no cause like inflammation of choroid, tumour of choroid or any other cause is found. In these cases, one or more tear or hole is found in the retina. Through this hole or tear, fluid gets between the two germinal layers of the retina and the superficial layers of the retina get detached. It is evident that the detachment would not be cured unless the hole or tear is closed.

Moderate and high myopia are important etiological factors.

Premonitory Symptoms

Flashes of light of greenish or bluish colour are signs of retinal irritation. If the flashes appear on the temporal side, the retina is irritated on the opposite *i.e.*, nasal side. The other premonitory symptom is the appearance of floating black spots, as a patient described them as "swarms of black spots" in front of the eye. On rest in bed or after sleep they either disappear or get less, only to appear again later. On the appearance of any of these symptoms the interior of the eye must be thoroughly examined.

Symptoms

The loss of vision is not an early symptom except in the rare cases in which the tear develops at the macular area. The loss of vision occurs when the detachment is quite near macular area making it oedematous or when the macula is actually detached. The dazzling of the eye on entering a brightly lit room,

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which did not worry him before, and defective adaptation on entering a semi-dark room are early symptoms. The most importannt symptom is the appearance of an area in the visual field where the patient does not see anything and this area is the area where the flashes of light were seen. As most of the detachments take place in the upper terminal or upper nasal quadrant, the loss of visual field is in the lower nasal or lower temporal quadrant.

Preliminary Treatment

This is extremely important. The aim is to limit the spread of detachment and to prevent the detachment of macular area. As soon as a sudden loss of visual field is discovered, the patient should be put to bed. As the subretinal fluid gravitates to the most dependant part of the eyeball, the position of the patient in bed is easy to determine. He should never be put flat on his back as in that position the most dependent part of the eyeball is the macular region. If the detachment is suspected on upper tepmoral side he should lie on that side without a pillow and so on. When an eye surgeon diagnoses a retinal detachment, he will arrange for a pair of staenopic glasses to limit the movement of the eyes. If staenopic glasses can not be improvised it is better to cover up both eyes. A drop of atropine every day into the eye is indicated after diagnosis. This paralyses the ciliary muscles and consequently the drag on the choroid and on the retina is abolished. When a patient is to be transported from one place to another, he should be sent as a stretcher case. Patients arriving from distant places as walking cases often arrive with complete detachment of retina. A large number of these cases does not become suitable for operation as neither the retina settles down anywhere, nor the tension of the eye rises to normal.

Treatment

A spontaneous cure of a retinal detachment where a tear is present in the retina is extremely rare. So conservative treatment either with medicines or with subconjunctival and other injections are practically useless. If a patient is encouraged, he is only too willing to give a trial to the conservative method, but by this valuable time is wasted as in this condition sooner a case is operated better the chance of success.

For the purpose of operation the very first thing is to find out the tear or tears in the retina. These are localised on the surface of the eyeball. The sclerotic is exposed and the area or areas are coagulated with high frequency diathermy current. The inflammation thus set up in the sclerotic, choroid and retina, on settling down, makes these structures adhere together and so the tear is sealed. If there is excess of subretinal fluid, this is evacuated with a diathermy needle in one or several punctures of the sclerotic and choroid.

Prognosis

Prognosis after operation is very good provided the case is operated early. In writer's clinic, from January 1944 to October 1948, forty-seven cases were operated and forty cases have been cured giving a percentage of 85·1.

Conclusion

At one time retinal detachment was an almost hopeless condition. A case, which is not operated, is almost certain to go completely blind. Sooner a case is operated, better is the chance of success. Even in cases of detchment of the macular area if the operation is undertaken within a month, there is reasonable chance of restoration of macular function. Under the circumstances one would like to impress that the medical practitioner should advise their patients, who have been unfortunate enough to be affected with this condition to undergo an operation as early as possible.

OBSERVATIONS ON ANAESTHESIA IN MAJOR THORACIC OPERATIONS.

(Further Report on Three Cases)

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In continuation of my previous article published in June number of the journal I am reporting three more successful conductions of anaesthesia in major thoracic operations. In all these cases intra-bronchical anaesthesia was maintained under positive pressure with Heidbrink's closed type Gas Oxygen and Ether apparatus with carbon-dioxide absorber.

It will not be out of place to mention here that during the last twenty-five years, Magill, Guedel, Waters, Gale, Gurd, Crafoord, Nosworthy, Hewer and others scientifically and systematically dealt with the anaesthetic problems of major thoracic operations and have shown that by improved modern anaesthetic technique exploratory thoracotomy is not much more risky then exploratory laparotomy.

Closed intra-bronchial anaesthesia was devised by Waters of Madison and is essentially a one lung anæsthesia. This method consists of introducing a ballooned intra-bronchial tube into the bronchus of the sound side and anaesthetics act in the healthy lung

tissues with resultant required anæsthesia and the affected lung being operated upon becomes practically immobile.

Crafoord of Stockholm attains one lung anæsthesia by bronchial tamponage or packing with gauze of the bronchus of the affected side and anaesthesia maintained by anaesthetic exchange with healthy lung tissues through intra-bronchial tubes.

In England, Magill's technique is more specialised than the above mentioned methods regarding the intra-broncial tubes and instruments achieving the same purposes.

Case Reports

Case 1—A Hindu female, aged 45 years. *On examination*: She was found to be of good build and nutrition, general condition fair, P/R.-76/18 per min., B.P-114/70 mm. of Hg, provisionally diagnosed as a case of mediastinal tumour projecting into the right side of the chest.

Exploratory thoracotomy was done on 10-10-48.

Premedication:—
Morphine sulphate gr. ⅙.
Hyoscine hydrobromide gr. 1/200
} given ¾ hour before the operation.

The patient was induced by intravenous Pentothal 0·4 gm. in 5 per cent solution followed by Gas Oxygen and Ether. Intra-bronchial tube size No. 6 was introduced into the left bronchus by the blind method and anæsthesia was carried on in closed circuit under positive pressure below 5 mm. of Hg. The anaesthesia was a calm and quiet one.

Nitrous oxide was administered during the operation at the rate of 200 to 250 ccs. per minute, Oxygen at the rate of 300 to 350 ccs per minute. The patient was bright pink all through.

Blood transfusion was started before the operation and continued at the rate of 30 to 40 drops per minute during the operation.

In this case the patient's posture maintained during the operation was supine with a couple of degrees Trendelenberg's position.

Case 2—A Hindu male, aged 38 years was referred from the medical side suffering from bronchiectasis of the lung for last 16 years. He was of average height and build and general condition was fair. Weight—82 lbs., P/R.—80/18 p.m., B.P.—110/68 mm. of Hg., Hb—85 per cent (Tall), Urine-albumin, trace., Sputum—no A.F.B.

Radiological report after lipiodol—bronchiectasis both lower lobes, more of the left lower lobe.

2/4/49—Left pneumonectomy done. Time of completion—1 hr. 50 minutes.

Premedication:
Morphine sulphate gr. ⅙
Atropine sulphate gr. 1/100
} ¾ hours before operation.

After induction with Gas, Oxygen and Ether the intra-bronchial tube No. 6 was introduced into the right bronchus by blind method. The tube was fixed with the anaesthetic machine and the balloon was inflated and one lung anaesthesia was maintained by the closed circuit positive pressure method. The pressure was maintained between 3 to 5 mm. of Hg. Nitrous oxide was allowed at the of 200 to 250 c.c.s per minute, Ether consumed during the operation was 3¾ ounces.

The anaesthesia was smooth during the whole period. There was no evidence of mediastinal flutter and paradoxical respiratory movement. The colour of the patient all along was good. The respiration was easy and regular, the rate was not fluctuant and was maintained steady throughout.

The pulse, respiration, B.P., plane of anæsthesia is charted below:—

Time	*Pulse per minute*	*Respiration per minute*	*B.P. in mm. of Hg.*	*Plane of anæsthesia*	*Remarks*
9-50 A.M. ..	84	18	110/68	Induction stage.	Induction started by Gas, Oxygen & Ether.
10-00 A.M. ..	104	30	..	do	....
10-10 A.M. ..	108	34	..	Second plane of surgical anæsthesia.	Intubation complete.
10-12 A.M. ..	..	..	..	do	Skin incision given.
10-15 A.M. ..	108	36	114/70	do	....
10-20 A.M. ..	114	38	..	Third plane of surgical anæsthesia.	....
10-25 A.M. ..	116	36	..	do	Pleura nicked
10-30 A.M. ..	122	34	114/70	do	....
10-35 A.M. ..	120	36	..	do	....
10-40 A.M. ..	128	34	..	do	....
10-45 A.M. ..	120	36	116/70	do	....
10-50 A.M. ..	128	36	..	do	....
10-55 A.M. ..	144	36	..	do	....
11-00 A.M. ..	146	38	116/68	do	Coramine 1 ampoule I.M. given.
					Coramine 1 ampoule I.V. given.

Time	Pulse per minute	Respiration per minute	B.P. in mm. of Hg.	Plane of anæsthesia	Remarks
11-05 A.M. ..	146	36	..	do	....
11-10 A.M. ..	134	34	..	do	....
11-15 A.M. ..	132	36	118/70	do	....
11-17 A.M. ..	..	..	..	....	Pneumonectomy done.
11-20 A.M. ..	140	34	118/72	do	....
11-25 A.M. ..	132	32	..	do	....
1-30 A.M. ..	124	30	..	do	....
11-35 A.M. ..	122	30	116/68	do	
11-40 A.M. ..	120	28	..	do	
11-45 A.M. ..	122	28	..	do	Thorax closed up & Ether switched off
11-50 A.M. ..	124	30	116/66	Second plane of anæsthesia.	
11-55 A.M. ..	126	30	..	do	Nitrous oxide discontinued & oxygen inhalation continued
12-00 Noon ..	130	32		do	do
12-02 P.M. ..	..	..	..	First plane of surgical anæsthesia.	Operation finished
12-05 P.M. ..	136	34	114/64	do	Oxygen inhalation continued through B.L.B. mask

Duration of general anaesthesia was 2 hours, 5 minutes.

12-02 P.M.—Operation finished, oxygen continued at three litres per minute through a B.L.B. mask.

1-15 P.M.—Patient coming round, Omnopon one ampoule injected.

6 P.M.—The patient conscious, sipping drinks.

The plasma was started before the operation and continued during the operation at the rate of 30 to 40 drops per minute and 250 ccs of plasma was given upto the end of the operation. The blood transfusion was started after the operation at the rate of 15 to 20 drops per minute and 250 c.c.s of blood was given upto 7 P.M.

The patient was operated in left kidney position with a couple of degree Trendelenberg's position.

Case 3—A Hindu male child, aged 9 years was transferred from the medical side as a case of bronchiectasis of the lungs. Weight—44 lbs., P/R.—94/20 p.m., B.P.—106/70 mm. of Hg, Hb—85 per cent, Urine—N.A.D., Sputum—no A.F.B. General condition, good.

Radiological report—bronchiectasis both lower lobes, mostly of left lower lobe.

Operation proposed—left lower lobectomy.

8-4-49—Thoracotomy, left, done. Time of operation—55 minutes

Premedication:
Morphine sulphate gr. 1/16.
Atropine sulphate gr. 1/200
} given ¾ hours before the operation.

After induction by ethyl chloride and open ether, intra-bronchial tube No. 3 was introduced into the right bronchus by the blind method and the tube was fitted with an adapter to the closed circuit Gas-Oxygen-Ether apparatus. Anaesthesia was maintained by Gas-Oxygen and Ether under positive pressure between 2 to 4 mm. of Hg.

Nitrous oxide was allowed at the rate of 200 to 250 c.c.s per minute. Ether consumed during the closed circuit anæsthesia was one ounce. The colour of the patient all along was good.

The chart of pulse and respiration per minute during the operation is given below:—

Time	Ppulse per minute	Respiration per minute	Remarks
10-00 A.M.	154	54	Operation started
10-15 A.M.	162	40	Lung exposed
10-30 A.M.	158	36	....
10-55 A.M.	164	24	Operation finished

Oxygen was continued at the rate of 2 litres per minute through a B.L.B. mask.

1-30 P.M.—The patient coming round. 7 P.M.—the patient conscious.

It is a matter of interest to note that as soon as the open ether circuit was changed to gas oxygen

and ether circuit of the anaesthetic machine, the respiration of the patient was found to be jerky in character. Later on the breathing improved to a great extent but the absolute calm and quiet type of breathing could not be achieved with a gas designed for general use for adults. To avoid resistance to breathing for infants Heidbrink Company have designed separate gas machine for infants.

Blood transfusion was started before the operation and continued during and after operation at the rate of 10 to 15 drops per minute. One pint of blood was given in 24 hours.

The patient was operated in left kidney position with a couple of degrees Trendelenberg's position.

Summary and Conclusion

In all these cases morphine was used as premedication with uniformly good results. We must bear in mind that morphine not only lessens the paradoxical respiratory movements and mediastinal flutter by diminishing the excursions of the lung but morphine also renders the respiratory centre less sensitive to normal carbon dioxide stimulus.

All the three cases were operated with the patient lying with a couple of degrees Trendelenberg's position with satisfaction and relief.

These cases also demonstrated well that blood and plasma should be administered slowly without embrassing the heart and the lung depending upon the shock caused during and after the operation.

Modified form of Anaesthetic Gas Machine avoiding the resistance to breathing for infants and children should be used for similar patients for the maintenance of smooth anaesthesia.

Now it is becoming apparent that by improved anaesthetic technique exploratory thoracotomy is not much more risky than exploratory laparotomy.

Positive pressure technique with closed circuit Gas Oxygen Ether apparatus seems quite satisfactory.

Acknowledgement

I am indebted to the superintendent, Lake Medical College Hospital for permission to publish the reports. My best tributes are due to the surgeons—Dr. S. Gupta F.R.C.S., and Dr. H. Sett, F.R.C.S., my colleagues and operation theatre staff of the hospital for the encouragement, interest and co-operation that I have received from them for the cases. I also express my thanks to anaesthetist Dr. S. Chatterji for his help regarding anaesthesia on the last case of the series.

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VAGINAL HYSTERECTOMY*

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Calcutta

The object of bringing this paper before the learned assembly is not to say anything new, but to give some idea of what treatment we are doing for the most common complaints, such as complete prolapse of the uterus.

In the last 5 years 45 cases, were treated by vaginal hysterectomy in my small ward of 32 beds, in the Calcutta Medical School Hospital.

The following are the chief complaints for which the operation was done:—

(1) Menorrhagia in advanced age not cured by other methods—9 cases.

(2) Chronic ulceration of cervix, suspected as pre-cancerous—3 cases.

(3) Badly lacerated, and ulcerated cervix with ectropion—3 cases.

(4) Cervical fibroid, or a big cervical polypus—3 cases.

(5) Early cancer of the cervix, where the appendages are free.

(6) Complete prolapse of the uterus in advanced age—26 cases.

Prolapse of the Uterus

Of the above groups complete prolapse of uterus in advanced age with unhealthy condition of the cervix, forms the biggest number.

Prolapse of the uterus is a common coomplaint in our country.

Etiology—In the class of patients that we get, perineal tears and other injuries of childbirth are not properly attended to, or stitched up unless there is some complication *e.g.* haemorrhage and in many cases they are allowed to heal up by granulation.

So after the first childbirth, there is some laxity of the outlet with some laxity of the transverse ligament of the cervix. With each child birth the laxity increases further and in many cases prolapse of the uterus occurs in the end.

In most of these cases the history shows that they are suffering from the prolapse for sometime, but they want the treatment now for some other complication, with the prolapse.

In 1912, and previous to that date, the usual method of treatment in Eden Hospital, Calcutta was *ventral fixation*, as the first operation and subsequent operation used to be *posterior coloperinorrhaphy*.

As prolapse of the uterus, is nothing but *hernia of the pelvic floor*, modern operation is done to repair the relaxed condition of the pelvic floor, the operation

* Read at the Silver Jubilee Session of the All-India Medical Conference, Calcutta, Dec. 1948.

which is popular now-a-days is known as the Fothergill's operation. (Dilating and curetting, anterior colporrhaphy, amputation of cervix and posterior colpoperineorrhaphy).

This operation proved satisfactory in most of my cases, but it takes a long time to finish all the steps of the operation. But in some cases, due to old age and laxity of tissues, there is relapse of the old trouble, with fresh prolapse of the vaginal walls.

For several years I am treating prolapse of uterus by the easiest method of *vaginal hysterectomy*, with splendid results.

Cases specially selected for vaginal hysterectomy are:—

(1) Prolapse in very old women.

(2) Cases with chronic ulcers, multiple tears, etc.,

(3) Precancerous condition of the cervix.

(4) Widows over 40 years, and of very weak constitution.

Both the appendages must be clear, and should show no sign of any old inflammation.

I find in this operation, (*a*) the patient never shows any usual deleterious sign of a big operation, (*b*) recovery is rapid, (*c*) the time required to finish the operation is usually half an hour; it very rarely exceeds ¾ of an hour.

A second operation for the repair of the perineum is necessary in most cases.

In my method I always keep the tied stump of the appendage outside the peritoneum, the cut edges of the vagina are stitched up with catgut. A big vaginal cuff is removed in long standing cases.

In none of my cases there was any complication after operation. I prefer this treatment for old patients for the following reasons:—

(1) No need of keeping an organ which will not do its function of childbirth.

(2) No chance of having any cancer of cervix or uterus.

(3) Time required for the operation is very much less than any other operation for prolapse.

(4) Recovery is rapid.

(5) No chance of any recurrence.

When there is prolapse of the uterus during the child-bearing period, I prefer to do anterior colporrhaphy, and post-colpoperineorrhaphy after a preliminary dilatation and curettage. In those cases where I find an elongated and hypertrophied cervix, I do the amputation of the cervix with the above operations.

SURGERY OF THE HEART*

AMOR SEN, M.S. (CAL.),

Calcutta

Pathological conditions of the heart—both acquired and congenital—have been the subject of extensive study by the Thoracic Surgeons in recent years. Although success has been claimed in only a few conditions nevertheless they have opened up new avenues of surgical work in this unexplored land.

I intend not to include the injuries of the heart, in this communication, as I believe it is a special subject by itself. But as a mark of success I may quote a few figures which are very encouraging to those who aspire to take up this branch of surgery.

In a meeting of the American Association of Thoracic Surgeons, Harken demonstrated by movie pictures some of the operations which he performed for traumatic condition of the heart. He has reported removal of foreign bodies—5 from the pericarium and 13 from the chambers of the heart—there was no death in any of these cases.

I like to present some of the pathological conditions in which surgery has shown its merit.

CONSTRICTIVE PERICARDITIS

First of all let us consider the surgeons' effort to relieve the patients' suffering from the effects of Constrictive Pericarditis.

Clinically this condition is manifested by the well known triad:

(1) increase in venous pressure with consequent engorgement of the veins of head, neck, abdominal wall and oedema of the dependent parts.

(2) ascites and enlarged liver.

(3) a small quiet heart.

A very remarkable feature is that the lungs are unaffected in most cases.

What is the main effect of this encasing fibrosis of the pericardium on circulation?

This is a limitation of diastole resulting in failure of the heart chamber to receive the full amount of venous blood. So on the arterial side there is a low systolic blood pressure with low pulse pressure.

The other effect is a reduction in the velocity of blood flow. Whereas normally it requires 16-21 seconds for the arm to tongue circulation in case of constrictive pericarditis it is much higher as much as 40—60 seconds.

Pathologically, the pericardium is greatly thickened and it is intimately attached with the myocardium. Plaques of calcium may be deposited over the heart, sometimes completely surrounding it.

One of the peculiar phenomenon in this condition is that the heart muscle, when relieved of this con-

* Read at the Silver Jubilee Session of the All-India Medical Conference, Calcutta, Dec. 1948.

stricting effect, in course of time, functions just like normal heart. I was watching one of these cases while being operated on. One is surprised to find how even on the operation table, does the heart start beating on removal of the membrane.

As regards the ætiology most of the cases are believed to be tubercular in origin; old pyogenic pericarditis sometimes may be a cause, while a third group has been recognised in which no cause has been found (idiopathic).

Surgical Treatment—Surgeon aims at producing relief by partial excision of this encasing membrane. Excision is aimed at primarily freeing the ventricle.

The usual procedure that Holmes Sellor has advised consistent with the safety of the heart is to resect the anteriorly placed pericardium continued over the apex and followed by freeing the left border of the heart. The interference over the auricle and the great veins is an extremely hazardous undertaking.

The Results of these Operations—The mortality of a published collected series of 143 cases is still very high as much as 33 per cent whereas 50 per cent is cured.

After operation the restoration of venous pressure towards normal is rather gradual. Holmes Sellor's experience is that it requires about 12-18 months to have a full and final improvement in lowering of pressure and reduction in size of liver and ascites.

Rapid amelioration of symptoms is a marked feature and it is very gratifying to see a totally incapacitating patient returning to active physical work.

Patent Ductus Arteriosus

Let us next consider how surgery is gaining ground in patent ductus arteriosus.

Ductus arteriosus is a channel which in embryonic life directs the blood flow from the right ventricle through the arota into the placental circulation for oxygenation of blood. When the foetus is born and lungs expand the ductus normally closes and blood passes to the lungs for aeration. Let us now consider what happens when the ductus fails to close. A reversal of blood flow then takes place when the left ventricle contracts; part of the blood from the aorta instead of being directed towards the systemic circulation is shunted into the pulmonary artery.

Obliteration of ductus histologically resembles a picture of endarteritis obliterans and it is a gradual process requiring many weeks to complete the occlusion.

Let us now consider the various complication of patent ductus:

(1) The shunt diverts quite a good amount of blood from the aortic circuit, so t hat the peripheral blood is deficient, resulting in considerable deficiency in nutrition and growth.

(2) There is always a potential danger of subacute bacterial endocarditis.

(3) Cases are on record where the thinned out ductal wall have undergone aneurysmal dilatation and have ruptured.

(4) There is a great load on both the right ventricle as it has to pump against increased resistance and on the left ventricle which must contract more forcibly to increase the minute output to compensate for the amount of blood that is passed by way of shunt.

I have placed before you the dark side but there are recorded cases of persons who have patent ductus without apparent disability.

Diagnosis—There are two important signs—one is physical and the other radiological.

The physical sign is the well known machinery like murmur—a continuous murmur with systolic accentuation over the second left inter-costal space and an associated palpable thrill.

The radiological sign is the great prominence of heart shadow in the region of the pulmonary artery.

It is said that the prominence of the physical or radiological signs will depend upon the width of the patency.

The Prognosis in untreated ductus in 92 cases in Abbot's series is as follows:—

Death due to slow cardiac decompensation ..	16
Death to subacute bacterial endocarditis ..	28
Death due to sudden heart failure ..	16
Death due to rupture of ductus ..	2
(The remainder died of causes unrelated to circulatory system).	
Average duration of life	(24 years)

The surgical treatment in this condition is directed towards obliteration of the duct either by ligature or by complete severance.

Results of the operation—(1) In every case the thrill disappears but the murmur may persist in some of the cases.

(2) The overactive forceful contraction of the heart has been changed to normal cardiac activity.

(3) There is rapid gain in weight.

(4) The patients have an improved cardiovascular system.

Mortality—In 632 patients reported by Gross mortality is 4·9 per cent. Recanalisation after ligature occurs in 10 per cent of cases.

Coarction of Aorta

The third condition in which the surgeons have been able to use their knives successfully is a developmental anomaly of the aorta, a congenital stenosis situated usually distal to the origin of the subclavian artery.

The question that comes naturally to one's mind is what is the disability in untreated cases and what is the necessity of surgical interference.

The main pathological change that is observed in a case of coarctation is the early appearance of arteriosclerosis in the arteries proximal to the narrowing.

The average length of life in patient with coarctation seems to be definitely low. A study of the literature shows that about 25 per cent i.e., ¼ of all cases die a premature death before the age of 20th year, that half of the cases do not survive beyond the age of 40 years and that 90 per cent of all cases die before the age of 50th year. The commonest cause of death in these patients is due to secondary lesion in heart and blood vessels. Abbot found congestive heart failure, cerebral haemorrhage and bacterial endocarditis are the most frequent complications leading to death.

Diagnosis—(1) High blood pressure in the arm with low femoral blood pressure is a very characteristic sign.

(2) Evidence of increased pulsation due to compensatory collateral circulation of internal mammary, intercostal and scapular arteries can be observed.

(3) Long systolic murmur over the precordium conducted along the dilated anastomotic channels may be heard.

(4) Enlargement of the heart may be present.

(5) Notching of the rib is a characteristic sign in a skiagram of the chest.

Radiological feature: *notching of ribs*—I saw a postmortem examination being done in one of these cases in which development of collateral circulation by great hypertrophy of intercostal arteries was the most striking feature.

Surgically direct attack on this constriction by resection of the involved segment followed by direct anastomosis was planned and has been successfully carried out first by Crawfoord in 1944.

The main problem which had to be faced in planning this operation is whether it will be possible to suspend the blood flow to all the organs as long as 20—30 minutes. So a long series of experimental and clinical studies were carried out by Crawfoord in Stockholm. Crawfoord came to the conclusion that in cases of aortic stenosis who had already developed a well-marked collateral circulation the aorta can be kept completely shut from the circulation as long as 27 minutes or longer without any appreciable danger to the internal organs provided the intracranial circulation is not interfered with.

Results:—Operation mortality—Crawfoord reported in 1947—15 cases of coarctation which he resected with death in one.

Late results—(*i*) The hypertensive pulse in the arms became normal.

(*ii*) The pulse in the legs, impalpable before operation became normal afterwards.

(*iii*) The pulse in the collaterals, palpable before operation, became impalpable.

The change in blood pressure as observed:—

		Before operation	*After operation*
Case 1—			
M. age 11	Arm ..	170/105	130/90
" "	Leg ..	100/70	140/80
Case 2—			
M. age 27	Arm ..	185/90	175/85
" "	Leg ..	95/70	155/70

FALLOT'S TETRALOGY

The most recent successful adventure of the surgeons in congenital heart disease is in the cyanotic group commonly known as Tetralogy of Fallot. Fallot's Tetralogy consist of:—

1. Pulmonary stenosis.
2. High ventricular septal defect.
3. Hypertrophy of the right ventricle.
4. Dextroposition of aorta.

Clinically these cases, according to the degree of stenosis, show a various degree of cyanosis which increase on slightest exertion, hence they are commonly known as blue babies. They usually prefer to adopt a squatting posture and present a marked clubbing of the fingers with extreme dyspnoea on least exertion.

Physical examination reveals a basal systolic murmur with normal second sound.

In radiological examination—two facts are very striking—

(1) Absence of normal fulness of pulmonary conus.

(2) Absence of pulsation at the hilum on fluoroscopy.

The altered physiology of circulation in this condition is mainly due to the stenosed condition of the pulmonary orifice, allowing only a very small portion of the alloted blood to the lungs for oxygenation and consequently lesser amount of oxygenated blood is being returned to the heart.

Principle of Surgical intereference as proposed by Dr. Blalock—Dr. Blalock devised his operative interference by which more blood can be sent to the lungs to compensate for stenosis, so that left ventricle will receive more oxygenated blood which it can pass to the aorta for systemic circulation, so that there will be definite improvement in the oxygenation of blood and consequently a marked reduction in cyanosis.

There is another factor of course, which cannot be corrected by this operation is the fact that aorta is receiving a mixture of venous and oxygenated blood due to ventricular septal defect.

In practice, Blalock divides the subclavin or innominate artery and anastomoses the proximal end of the artery with either the right or the left pulmonary artery.

Results of the operation—There is an appreciable improvement in patient's colour following the operation followed by gradual disappearance of clubbing of the fingers and increase of exercise tolerance.

Operation mortality—Upto May 1946 Blalock had performed 144 operations with a total mortality rate of

22 per cent. In recent reports this number has reached to 450 with a reduction in mortality rate to 17 per cent.

Two other operative procedures have come into the field for this condition. Pott has devised an operation of direct anastomosis between the pulmonary artery and the aorta after their emergence from the ventricles. But this procedure has not been met with much favour.

Recently a new line of approach to this prooblem has been made by Brock of Brompton Hospital *viz.*, direct tackling of the valves which I will refer to later on.

Future Vision of Cardiac Surgeons

These operative procedures that I have discussed have been fairly established—the results of successful surgery are very encouraging although the mortality, even in the hands of the top-rank surgeons, are still very high.

Let me now put before you the future vision of cardiac surgery for which the pioneers are engaged.

(1) *Surgery in Coronary Occlusion*—Claude Beck who is working on this problem for pretty long years thinks that the most effective method to relieve this condition is by producing extra coronary anastomosis, *i.e.*, vascular communication between coronary arteries and arteries of tissue grafted upon the heart.

Recent study shows that coronary venous ligation in experimental animals gives a very encouraging result in opening up new collaterals.

Mercer Fautex from Boston reported a case of a man who lived 2½ years after ligation of great cardiac vein. After death histological section shows that ligature of great cardiac vein opens and dilates the coronary anastomasis. Being stimulated by these results he tried this operation in some of his patients. The results are as follows:—

In all patients who survived, it was observed that although venous ligation produced great benefit, yet these patients were not immune to the disturbances produced by reflexes from the coronary nervous system. Coronary reflex could still provoke pain by producing transitory inchaemic myocardial state and cause ventricular fibrillation and sudden death. Some of his patients even after ligation of great cardiac vein showed evidences of these nervous influences. Consequently it was thought that probably a neurectomy of coronary nerve plexus in addition to the venous ligation would be the right answer to this problem. So pericoronary neurectomy, the removal of nerves at the base of the heart and in the region of the left coronary artery will be an additional beneficial procedure for these cases.

(2) *Surgery for repair of intra-auricular septal defect.*—The next condition for which surgery is under consideration is that of intra-auricular septal defect. Experiments are being conducted in which septal defect is being repaired by part of the auricular wall itself. The technical procedure is very complicated and no case has yet been recorded of this operation in human beings.

(3) *Surgery for mitral stenosis by creation of intra-auricular septal defect.*—The third condition in which surgeons are thinking to extend their field is the relief of mitral stenosis by creation of intra-auricular septal defect. In his book on Heart Disease, White has stated that this septal deficiency has been given the credit for relieving somewhat the burden imposed on pulmonary circulation and right ventricle in cases of marked mitral stenosis and thereby prolonging active long life. White has quoted several cases of this combination of mitral stenosis and auricular septal defect in which a woman of 74 had passed successfully through eleven pregnancies, another woman of 61 years had gone through seven pregnancies without heart failure. Consequently, so long as we cannot directly tackle the mitral valve, indirect procedure aiming at relief of the burden on the heart is worth considering.

(4) *Direct intervention in cases of congenital pulmonary stenosis*—Valvulotomy is an operation which had died out from the field of cardiac surgery except for some experimental procedure since its ardent advocates Cutler and Beck who introduced it in 1912.

Recently Brock of Brompton Chest Hospital has reported 3 successful cases of valvulotomy for congenital pulmonary stenosis. His patients are reported to be alive, their cardiac condition improved.. By means of a specially devised cardioscope he has made a number of direct inspections in living patients.

In his cases of valvulotomy he used an instrument specially made for him. He approached the heart chamber through an opening made in the wall of the right ventricle.

The work of Brock is very encouraging and according to Brock pulmonary valvulotomy is a feasible operation.

The next procedure of direct intervention for increasing blood supply to the lungs is being undertaken experimentally by Hurwitt from the department of pathology of Harvard Medical School. In this procedure Hurwitt is trying to put a plastic polythelene tube, one end of which is attached into the pulmonary artery distal to the stenosis and the other end to the right ventricle. In cases in which this method was successful it was found after sacrificing of the animals that the tubes inserted are not dislocated from their original position and the tubes are covered on outside by thin fibrous membrane.

KARELA AND DIABETES

S. RAM, M.A., (CANTAB), F.R.I.C.,

New Delhi

The idea still persists among a few medical practitioners that the extract of karelas, *Momordica charantia* (Cucurbitaceæ), cures diabetes mellitus as diagnosed by estimating sugar excreted in the urine.

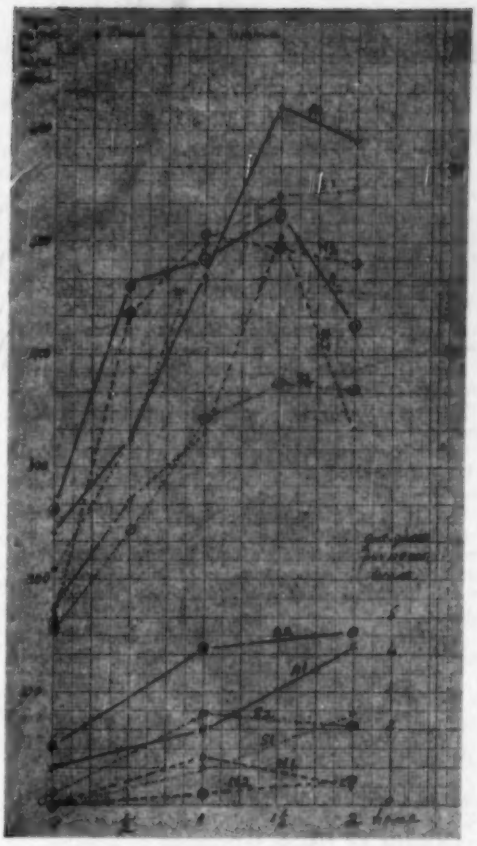
Three patients have been given karela extract, prepared as follows, twice a day:

Half a seer karela are cut into pieces after washing, put into 5 cupfuls of water and boiled until only 2 cupfuls remain, when the solid is removed. One cupful of the extract is given in the morning and one in the evening.

Notes on the Patients so Treated

These are shown below in a tabular form:

Initial	*Sex*	*Age*	*Place of treatment*	*No. of days when diet controlled, tolerance test being done at the beginning and at the end*	*No of days the extract was given*
A.	F	50	L. H. H.	16, basal diet last 12	Last 7
N.	F	60	At home	27	Last 24
S.	F	32	L. H. H.	9, basal diet last 4	Last 5



Graph showing Blood Sugar (upper) and Urine Sugar (lower) Levels in three Patients before and after Karela Treatment.

Results

The analysis of the results of treatment is given in the table below:

Analysis of Results of Urine and Blood Sugar Estimation Before and After Treatment

Before Treatment	*Urine sugar in gms per 100 c.c. done at different hours*					*Blood sugar in mgms per 100 c.c. done at different hours*				
	0 hr.	½ hr.	1 hr.	1½ hr.	2 hrs.	0 hr.	½ hr.	1 hr.	1½ hr.	2 hrs.
A ..	1·02	—	1·97	—	4·23	238	326	469	618	588
N ..	0	—	1·3	—	0·47	173	271	328	506	336
S ..	0	—	0·99	—	2·45	208	328	500	540	546
After Treatment										
A ..	1·62	—	4·18	—	4·6	258	458	484	526	426
N ..	0	—	0·28	—	0·62	163	437	507	497	488
S ..	0·31	—	2·42	—	2·05	157	243	344	375	369

The results are also indicated in the graph supplied.

Conclusion

There seems to have been no real improvement in the condition of the patients, other than what could have been due to the giving of a basal diet. The dieting or/and treatment with karela may have produced the slight increase in the rate of absorbtion and excretion of the sugar.

It might be dangerous to rely long on this karela treatment and delay in dieting or insulin treatment of diabetes.

Acknowledgment

Thanks are due to P. V. Nayar, M.B.B.S., for drawing attention to this tradition, and to S. Chaudhuri, M.D., and R. Vethavanam, M.R.C.P., M.R.C.S., for the cases.

SPECIAL ARTICLES

A STUDY AND A CRITICISM ON CHOPRA COMMITTEE REPORT

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AND
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Chopra Committee's report was made available to the general public in May, 1949. Till then only through the press—lay and medical—the general public had only a summary of recommendations made by the Committee. The report is issued in two volumes. Vol. I contains the report and the recommendations in 200 pages and Vol. II contains appendices in 550 pages.

The Government of India in a press note dated 19-12-46 announced the functions of the Committee as follows:—

1. To suggest the provisions that should be made for research in indigenous systems of medicine, such as Ayurveda and Unani Tibb and the provisions that should be made for the application of scientific methods for the integration of the indigenous systems of medicine.
2. Measures that could be taken to improve facilities for training in India, these systems of medicine.
3. The desirability of State control for the practice of these systems of medicine, and
4. The other measures to be taken to increase the usefulness of the system to the public as a part of the comprehensive plan.

To these four functions, a fifth one was added, while inaugurating the Committee, on 22nd March 1947, as follows, by the Hon. Raja Gazanfar Ali, the then Minister for Health, Government of India:—

"An enquiry as to ,whether the three systems Ayurvedic, Unani and Modern cannot be combined into one all comprehensive system." The Hon'ble Minister also added that "Medicine should be the common possession of mankind and as such anything which is of value, anything which the systems—old and new—have to contribute should be pooled together and placed at the service of humanity" (Vol. 1 pages 9 & 10).

The Hon'ble Minister also asked the Committee to specially consider the possibility of working out a synthesis of the indigenous and the Western systems of medicine.

It is very curious that this fifth term of reference should have been added *three months* after the issue of the Press Note of December 1946. What made the Hon'ble Minister to do so can only be surmised or conjectured at this distance of time. But it is certain that it is on this issue mainly that the medical profession has thought fit to differ definitely from the findings of the Committee. In fact it has proved a veritable bone of contention; but for this recommendation for 'synthesis' by the Committee, the medical profession in India would not have been put on its 'mettle' and the Committee's report would not have received much publicity and notice at the hands of the profession. The Committee thereafter started work and issued its Report in two Volumes at the end of 1948. It visited 19 places, visited in all 37 institutions in these places and examined 322 witnesses. It also went into the work done by other Committees set up by the Provincial and other Governments—Burma and Ceylon—for the same purpose. It went into the memoranda of these Committees and into those submitted by various individuals and associations on Ayurveda or Unani or modern medicine.

The Indian Medical Association, representing the bulk of the medical practitioners of modern medicine, all over India also submitted its views in a memorandum.

The Report is issued in two parts. Part one contains a summary of the report of the similar Committees appointed by various Provincial Governments. It also relates in details existing conditions of medical relief in India and the present state of indigenous systems of medicine. Then it comes to relate the reasons why, in its opinion, there is need of synthesis of the Indian and Western systems of medicine. It quotes the opinion of laymen and medical men in favour of integration and synthesis and also describes the difficulties about integration and the various steps necessary to be taken to bring about the so called synthesis. Later it describes the medical education as it should be, in the Committee's opinion. Here it recommends a degree course of seven years after Matriculation, and a diploma course of (as an interim measure) of three years, with six months additional course for Preventive medicine and Hygiene. Then come the organisation of rural medical Relief and the State control of medical practice and education and lastly the question of research. The Committee suggests research to be carried out (1) in literature in Indian medicine, (2) on its fundamental doctrines, (3) clinical research, (4) pharmacological research, (5) research on diet and domestic medicine and (6) research in psychological medicine and they want a separate Board of Research in Indian medicine. And lastly comes the classification of remedies, identification of medicinal plants and the preparation of a Pharmacopoeia of Indian Medicine. The Report closes with a summary of its 76 recommendations on the subjects I have enumerated above.

The second volume of Chopra Report contains appendices giving memoranda submitted to the Committee. Learned and earnest-minded men have written them. The views are conflicting but the arguments and theorisations contained in them make an education.

AGREEMENT OR DISAGREEMENT ON VARIOUS QUESTIONS

Everybody practically agrees that research may be carried out in Indian medicine and whatever is found to stand the test of scientific investigation may be incorporated in other systems. Even the I.M.A. has said that it is quite possible to synthetise and

absorb, after scientific investigation, all that is of proved value in these indigenous systems, into the corpus of the scientific system of medicine that is taught all over the world. On the question of reform the I.M.A. has clearly stated in its memorandum that if any branch of Ayurveda medicine is sought to be reformed, in the light of modern knowledge apparently enough, it will become the corresponding branch of modern medicine. Therefore the process should be reversed, that is whatever in Ayurveda stands the test of specific scrutiny should be absorbed and synthetized into modern scientific medicine. The process which is rational will be easy, economical and efficient and will prevent the reduplication of teaching same or similar subjects in parallel institutions without any uniformity of standard. "The Chopra Committee holds the view that whatever is good in Western Medicine must be incorporated into the basic Corpus of the Indian system. The Committee's admiration for the advances in Western Medicine in the last 100 years is very great and so it advises the taking up into the Ayurveda the following subjects from the Western Medicine: Surgery, Obstetrics, Gynaecology, Structural physiology, Scientific Anatomy, Pathology, Bacteriology, Public Health and Hygiene plus, of course, the basic science of Physics, Chemistry and Biology, which must also be taught to students, who wish to take the Committees' synthetised courses in Indian Medicine."

Then again "in diagnostic methods and appliances too, Indian medicine is weak and could profitably borrow a great deal from the West." But if so many subjects are taken from Western Medicine and its diagnostic methods and appliances are also to be borrowed, the question at once arises—what is left out of Western medicine? The Committee suggests that "the exponents of Ayurveda maintained that their system was strong enough to absorb all what was useful in modern medicine and yet it could maintain its individuality." The Committee practically opines that even-though 85 per cent of subjects are to be taken up or borrowed or seized upon under the cover of the word "synthesis" from the Western or modern medicine, the great Mahanada should flow into the static and stagnant pool of Ayurveda—the sea must flow in to the river and not the river into the sea—that is, what in effect, the Committee thinks, it should be. Such an argument is neither convincing, nor honest. The Committee has here woven a fantasy in inconsistency.

Chopra Committee admits that the so-called synthesis they advocate is not easy, it will be time-consuming and yet they say it is not only possible but practicable and essential. The conditions necessary to fulfil, before synthesis becomes practicable, are, in the Committee's opinion, as follows:—

(1) Competent teachers; these should possess *both* an allopathic degree and a degree in Indian medicine, because a teacher with a degree in one system cannot give an unified view of a subject to his pupils.

(2) The second condition is that there should be a keen type of students. This is in answer to an objection raised by certain witnesses that if both the indigenous and the modern medicine are taught together, there is bound to be confusion in the mind of the student; but the Committee summarily dismiss this objection by saying that "this should not be if the teachers and the taught are of the right type"; Confusion can only arise when teachers are not well versed in both systems. But given good text books, competent teachers and keen type of students, this is not likely to happen (P. 90 Vol. 1). It will thus be a problem while admitting students, to sort them out as keen and dull types or as right or wrong types. And what will happen if both the teacher and the taught are of the wrong types, *i.e.*, liable to confusion? And what will be the fate of the patients who fall into the hands of this confused duality? We leave it to the readers to imagine.

(3) Unified Text Books is a third condition necessary for synthetic teaching. This means a compilation of special text books for the special students of this integrated system. In what language these text books should be written is again a question. It must be the regional language of the province. In a place like Bombay the text books will have to be in Gujerati, Marathi and Kanarese. Besides his mother tongue the student must also know the National Language which will be decided upon by the Government of the country; he must also know English, so as to enable him to keep abreast of the latest advances.

(4) Then again in the Committee's opinion, there should be a Research Institute, where eminent experts of the Western and Indian Systems should work side by side, discussing, testing, checking and verifying various hypothesis and theories, with a view to either rejecting or harmonising them. We wonder if any purpose can be served by bringing together persons who have been trained in methods poles apart and asking them to integrate their methods. The Committee also says that the object of Research is to clear Indian medicine of accretions of centuries of doubtful value and to make its Science and Art intelligible to modern minds and to work out a synthesis of the two systems of medicine, Indian and Western (P. 193 Vol. 1). And finally the Committee crowns all these suggestions when it says that "there is not any great diversity of opinion in the fundamental principles of Indian and Western medicine!" This is a curious statement, at total variance with the general opinion, held by the medical profession, as also by many witnesses who appeared before the Committee to give oral evidence.

Altogether 322 witnesses gave oral evidence before the Committee—Vaidyas, Hakims and Doctors. Studying and analysing in details the evidence given by these 322 witnesses, one finds that nearly 162 witnesses have clearly declared themselves against synthesis of Indian and Western systems of medicine; about one hundred witnesses opined in favour of synthesis; 28 gave doubtful replies to this question and 32 were either not questioned about synthesis at all or gave replies which could not be classified. A very large number of Hakims who gave evidence,

declared themselves against synthesis, some saying that it may even prove harmful. Regarding Vaidyas, Kaviraj s and Hakims who have opposed synthesis, the Committee simply comes down on them and asks them "to be able to show that their medicine is equally strong, scientific and based on solid foundation. If they cannot do this, their systems have no right to exist. They should therefore bodily face the prospect of integration and synthesis in the interest of humanity and agree to the pooling of all that is best anywhere to alleviate suffering and combat disease." To Doctors who are opposed to synthesis, the Committee does not give a threat or a scolding, but mildly suggests "a study of Indian medicine without prejudice before they call it unscientific and useless." And so it is clear that a majority of witnesses were against synthesis, but even they have agreed to experiment and find out by research, if there is anything good in Ayurveda which could be incorporated into the Western Medicine. Even those who have opined in favour of synthesis have put in a lot of qualifications; both "Ayes" or "Noes" have thus their own doubts and perplexities. One or two witnesses refused to allow the result of trials in Indian Medicine to be tested by Western Methods. Some one also said that research institutions should be started and carried out on purely Ayurvedic lines, without any admixture of modern science. Some witnesses even said that "it may not always be possible to differentiate and demonstrate by modern methods the final changes that may take place in the medicines prepared according to the methods laid down for Ayurvedic prescription" (P. 65) and the attitude of several other Vaidyas was hostile to the incorporation of any innovation based on modern advances.

In their view everything should be based on old systems and Sanskrit Texts (Vol. II, P. 52) and yet others opined that Ayurveda should be taught according to the old and usual methods and whatever standard is finally settled must be uniform for all India (P. 71) Vaidya Benimadhav Shastri felt that subjects of modern medicine need not be taught to the practitioners of Indian Medicine (P. 105). The best of Vaidyas have always opposed mixing up Ayurveda with Western Medicine. They want Ayurveda to develop on its own lines and would have nothing to do with modern medicine. And inspite of all these facts and opinions, the Committee has opined that the Indian and the Western System could be and should be integrated together, "while Indian Medicine can take much of practical value from Western Medicine especially in the fields of Surgery, Obstetrics, Structural Physiology, Pathology and Diagnostic methods and appliances, the latter can also learn much from the philosophic background of Indian System, its comprehensiveness, the importance it attaches to the soil factor and dietary, its generalisation of principles and the knowledge of truth gained by supra-sensory perception"! Could false pretensions and perverse argumenting go further? Is it honest, we ask, to take 85 per cent of subjects from Western Medicine, add one or two subjects like materia medica or medicine from the static Ayurveda, then call it "integrated" system of medicine and teach that to students under the name of synthesis and under the roof of an institution called an "Ayurvedic" School or College? The Committee says that if you do not synthesise, these will be surreptitious or overt borrowing from the Western Medicine. It means that if you synthetise then all illegality of borrowing will disappear; if you agree to synthesise then it would cease to be surreptitious borrowing'—the illegal seizure of so many subjects from Western Medicine would be legalised? Arguments like these make the report a most curious and perverse document. No two words in the English language have been so much misapplied and misused or abused as the two words 'integration' and 'synthesis' have been by the Chopra Committee. These words are meant to be used as a safety or smoke screen for taking as much from the Western Medicine as possible and allow the resultant to be decently called the "Indian System."

I would call that writer more clever, if not more honest, who said that the Indian system of medicine was so broad-based that it could well annex the territories of Western Medicine!

What is there, we ask, what could be there—to integrate between two systems of medicines, whose very fundamentals are different and jar against each other? Synthesis can only be between two active living and harmonious systems. One of these, the Ayurveda, is admitted by everybody, even the Chopra Committee, to be static. Looking to the condition into which Avurveda is at present, the word "static" is quite mild and very shielding. And yet this system mildly called "Static" which has got to get rid of accretions of centuries, is recommended for mixing up with the living and ever progressive Western Medicine under the screen of "Synthesis". Why not say openly and quite frankly that you wish to teach allopathy because the teaching of mere "static" Ayurveda will not give the student a status in life, it will not carry him anywhere in the world, without the prop and support of the Western Medicine? Why create a back-door entrance to allopathy in this overt way, by the deceptive device of "integration and Synthesis"?

In this system of mixed teaching, there are two components (1) The Ayurvedic component meant to appease public sentiment and please the public who "clamour for our old system" and (2) The Allopathic component which is really the live part of the scheme, the curative or operative or the real service part of the mixed scheme. It is thus as we said, that back-door entrance to allopathy is created; because when the Western system preponderates in the curriculum, the Ayurveda is sure to be relegated to a subordinate position. The result would be that the student will be induced to take to Western Medicine and call himself a Doctor than to the Ayurvedic System and call himself a Vaidya. It is for this reason that the best of

Vaidyas dislike this mixed or "integrated" teaching under the pseudonym of "Integration" and "Synthesis" and behind the safety screen of Chopra and other similar Committees. It is we are very sorry to say, some of us, trained in the Western System of medicine who have been advocating this hybridisation of Western medicine, with the Ayurveda and Unani. We like to think that if that great Savant of Western medicine, Sir William Osler were with us today, he would give a stern scolding to those of us, who have been advocating this unholy alliance. I am also equally sure that if Zandu Bhatt or the great Wag Bhatt were amongst us today, they would deliver an equally strong rebuke to those Vaidyas who have been sponsoring this mixed teaching under the deceptive title of "Synthesis."

Summary and Conclusions

1. Ayurveda is full of "accretions of centuries of doubtful value" and has been "static" for centuries. Research is therefore necessary to find out what is good and worth incorporating into the Western System.

2. The basic thing should be the corpus of the Western Medicine and into it, should be incorporated whatever is found, after research worth incorporating from the other systems.

3. If the major part of teaching is to be carried out with subjects like Surgery, Obstetrics, Gynaecology, Pathology, Public Health and Hygiene borrowed from Western Medicine and if the diagnostic methods and appliances of the Western Medicine are also to be borrowed and made use of, it is not at all honest to call it the Indian System of Medicine, under the clever plea that science is one and indivisible; and that you have made a "synthesis" of the two systems, (the Indian and the Western). "Synthesis" under the circumstances is nothing less than a back-door entrance to the Western Medicine (Allopathy). To be able to contribute nothing to the so called synthesis and yet to try to dominate by calling it "Indian System" and teach it in a School of Medicine called "Ayurvedic" is nothing but hypocracy and raising of false claims.

4. The so called "Synthesis" produces neither a good Doctor nor a good Vaidya or Hakim, due to the fact that the knowledge gained by the students in both the systems is very poor and consequently they are forced to practise double quackery. It would be dangerous to allow half baked Doctors to treat for millions in towns and villages.

It will also lower the reputation of India in the eyes of the world, if the impression is created that we allow our sick to be treated by half baked Doctors, who are products of a low standard of teaching in the so called "synthetised" medicine. And all this in these days when a proposal or a move for the creation of International Medical School in each of the 36 Health Regions of the world is supported by our own representative at the meeting of the World Health Organisation at Rome, and Sir L. Mudaliar asked for a world wide survey of medical training facilities and for the establishment of minimum standards for medical schools? (*Times of India* 20-6-1949).

5. It would be fatal to the progress of medical science in this country if through mere reverence for the past, old ideas and practices, superseded or refuted by modern scientific investigation, are sought to be revived.

6. It is high time, our leaders and Health Ministers realised and decided, even at the temporary cost of popularity, that India will not be content with anything less than the best and the most progressive in modern medical science.

INDIAN MEDICAL ASSOCIATION AND THE SCIENCE OF AYURVEDA*

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Indian Medical Association is a scientific body and 'the objects of the Association are the promotion and advancement of the medical and allied sciences in all their different branches.....' In memorandum on the Indigenous Systems of Medicine, it remarks "The I.M.A. has considered the subject from the point of view that particularly appertains to all students of scientific medicine." A scientific organisation has considered a scientific subject from the point of view of all students of scientific medicine. As a member of this scientific organisation it pains me very much to find that it acts in the most unscientific way and I have already taken every opportunity to draw the pointed attention of the I.M.A. to this point.

The plea for presenting this article.

I have made every attempt to move the I.M.A. to act in a scientific way but failed. Prompted by the very excellent advice of our *ex*-president, Col. Amir Chand, I approach I.M.A. again, for rectification of the evil done already. Col. Amir Chand, in his presidential address, Bombay, has advised very adequately—"The role of the expert is not to stand aside and watch society fall into pits which he has foreseen only coming to its aid when he is invited after the catastrophe, but to make his warnings heard before any harm is done." (p. 18). Although I can not claim to be an expert on this subject, the little knowledge I possess of Ayurveda is sufficient to make me feel it my duty to move I.M.A. repeatedly with the view "to make my warnings heard before any harm is done."

* Please see the Editorial note at the end of the communication.—Ed.

The Documents

The establishment by the Government of India of the Committee on Indigenous Systems of Medicine (commonly known as the Chopra Committee—abbreviated Ch. C.) has given opportunity to the Indian Medical Association (abbreviated I.M.A.) to record their views on this matter. As a result, the I.M.A. has produced four documents, *viz.*, (1) the questionnaire circulated amongst members of I.M.A., and others, issued by the convener, Central Sub-Committee, I.M.A.; (2) the draft memorandum to the Working Committee, I.M.A. submitted by the central Sub-Committee. So we shall refer these two documents under the name of Dr. Sen Gupta; (3) the memorandum of the I.M.A. (Abb. Memo) on the Indigenous Systems of Medicine to the Ch. Committee and lastly (4) the Editorial of the *J. Indian M. A.* (June 1949) on Ch. C. report. A critical review of these four documents is the subject matter of this communication. To this is added the presidential address of our *ex*-president Col. Amir Chand.

THE CHOPRA COMMITTEE REPORT
Neither Fish, Nor Flesh, Nor Good Red Herring

One wonders how the Editorial of the I.M.A. can use the above language. It is regrettable that our beloved journal, the mouth organ of one of the most learned societies in India, has come down to the standard of a trash. It is unbecoming for the editor of such a journal to use the above language with respect to the highly respectable committee appointed by the Central Government. We the members of I.M.A. feel ashamed to see that the editor whom we have placed our confidence has lowered the esteemed journal in the eye of the public. In these days of four freedoms, one must respect the freedom of speech not only of committees but also of individuals and one must not be vilified only because 'it has failed to profit by the suggestion of I.M.A." It would have been the best course then, for I.M.A. to have placed its suggestions to the Central Government saying that here is the only and best suggestion and demand the Government to withdraw the Ch. C. as it would have been useless to proceed further and so save lots of money, time and energy.

Suggestions and Reasons Offered by I.M.A. Memo

And what are the suggestions of I.M.A. which the Ch. C. has failed to profit by? Let us quote from the memo.

"One and only conclusion—All this leads to but one and only conclusion possible, namely, that the 4 or 5 books of Ayurveda, as they exist today, can supply to us some drugs and theories for investigation and research but cannot be utilised as a system for standardised teaching, nor can it be practised as a profession. *What remains today* is a mass of mutilation, adulterated and interpolated containing some time-honoured drugs and medicine most of which are specimens of poly-therapy without reference to chemistry and incompatibility—and a certain number of clinical aphorisms."

"Question of Reform—If any branch of Ayurvedic medicine is sought to be reformed in the light of modern knowledge, apparently enough, it will become the corresponding branch of modern medicine. Therefore the process should be reversed, that is whatever in Ayurveda stands the test of scientific scrutiny, should be absorbed and synthesised into modern scientific medicine. The process, which is rational, will be easy, economical and efficient and will prevent the reduplication of teaching same or similar subjects in parallel institutions without any uniformity of standard."

It is undoubtedly a pity that the Ch. C. could not see eye to eye with the I.M.A. And, what is the background on which the I.M.A. has come to this 'one and only conclusion'? The Central Sub-Committee, appointed for this purpose, as well as the Memo. itself are of the opinion—"that these systems of medicines should be thoroughly examined and investigated with an opend mind."

The draft by Dr. Sen Gupta goes so far as to demand—"It demands of a spirit of investigation in quest of truth in order to add to the store of knowledge left by workers and authors of old."

The I.M.A. should have started with this examination and investigation before giving any opinion and must possess a spirit of investigation in quest of truth as per the draft memo. Have they done so? Far from it. Further, most, if not all the members of the Working Committee as well as the Central Sub-Committee are absolutely innocent of Ayurveda and no non-member experts have ever been invited to help them as empowered by the Working Committee in their meeting held at Delhi in March 1947. Further, all the four documents, under review as well as the presidential address of the *ex*-President, are full of incorrect, misconceived, misquoted and misleading statements on the science of Ayurveda, the I.M.A. apparently acting only as the drainage inspector with Miss Mayo mentality.

Basis of the Conclusion & Suggestion of I.M.A.

And what are the basic reasons which led the I.M.A. to come to the above conclusion and hence the suggestion? The memo itself supplies the material to the readers. A review of this wonderful literature takes one aback with surprise and disgust, how an august body, the I.M.A., a scientific body could cater such an incorrect, half truth, misquoted literature to the Government of India.

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Incorrect and half Truth Statements

The memo says, "The four great works of Ayurveda are therefore those of Charaka, Sushruta, Vagbhata and Madhava. Thereafter no original work of Ayurveda was produced—and the history of Ayurveda lapsed into a period of stasis and stagnation."

Let us give the following information to the I.M.A.

(1) Gananath Sen in his introduction to 'Pratyaksha sariram" (1911-40) from which Dr. Sen Gupta could quote only one passage, viz., *"Sharire susrutonasthah"* has dealt with more than 50 authoritative books to Ayurveda.

(2) In his 'Ayurveda Paricaya' (1350 B.S.). Gananath Sen gives the description of 271 books, other than those 50 already reported. These have been classified under the following heads—By redactors—3, by compilers—10, by commentators—26, on *rasa* (mercury)—38, on pharmacology—more than 11, and miscellaneous—123. In South India—61, total 271. All these books are extant today and written in Sanskrit. Most of them are written after the 12th century A.D.

(3) Rakhaldas Sen, in his book 'Rasasastram' gives a list of 205 books on Rasasastra alone of which 40 are in print. His collection of this list is from books existing in the library of his teacher, Gananath Sen.

(4) P. C. Ray in his 'History of Hindu Chemistry", records the result of his study on chemistry from 14 books published between 11th, and 16th century and has been enamoured of the great lore of iatrochemistry in them. All these books are extant and are very common in use.

(5) The Osman Committee—A committee formed by the Madras Government on Indigenous Systems of Medicine in their report (1923) publishes the names of 475 Sanskrit Ayurvedic books still extant and 49 not yet been traced, being quoted in authorative commentaries. They supply the following list published in Madras alone.

(*a*) 1937 Siddha works of which 776 are in print. (*b*) Latest works by Vaidyas other than Siddhas, etc., numbering 113, all in print and (*c*) 495 Telegu and Malayalam Ayurvedic works of which 455 are in print. The report states further,—"The famous works published in Bombay, Calcutta etc. are not included in the list." (Osman Committee Report App. IX. List of books covering pages 135-153 of foolscap size print).

Yet our learned Dr. Sen Gupta and the I.M.A. have the gut to declare that there are only 4 or 5 books on Ayurveda. All these go to show how grossly incorrect the statement of I.M.A. is and with what knowledge I.M.A. in their Memo want to teach Ch. C. that "the 4 great works of Ayurveda are, therefore, those of Charaka, Susruta, Vagbhata and Madhava. Thereafter no original work of Ayurveda was produced and the history of Ayurveda lapsed into a period of stasis and stagnations."

Dr. Sen Gupta and the Memo say—"We may refer here to the great controversy, that raged for 10 years (1922-1931) and yet was never settled, between Kj. Gangadhar Sashtri Joshi and M. M. Kj. Gananath Sen, M.A., L.M.S., about the interpretations of *kala, peshi, snayu, shira* and *dhamani* which was published in a pamphlet brought out by the latter entitled 'Sanja-panchaka-vimarsha.'

It is a pity that Dr. Sen Gupta and the I.M.A. know the existence of this book only dealing with a controversy between individuals, which again was more than 20 years old. But much water has flown down the Ganga during this period and it is tragic that neither Dr. Sen Gupta nor the I.M.A. ever cared to know that a vast amount of literature has grown in recent years on the Ayurveda Sharira particularly by Kj. Jyotish Chandra Saraswati, and by the present writer who have published papers in English, Bengali, Hindi and Sanskrit in various journals.

Misconceived & Misquoted Literature

The memo has quoted the following from Dr. M. N. Agasha and says: "The scheme..... contains impossibility of interpretting the old terminology. He impossibility of interpreting the old terminology. He asks with several queries, under each term, the meaning of *rasa* (plasma? tissue fluid? C. S. fluid?), *meda* (fat? red bone marrow?) *majja* (contents of bones? brain?)". The memorandum submitted by Dr. Agasha is before me and I quote the relevent passage in full. Dr. Agasha writes—"It (the science of Ayurveda) has a very well organized idea about 'physico-chemical' processes being at the bottom of all conversions of food-stuffs into tissues and it may be said, even of reconversion of the 'dosha' to a 'dhatu' by physico-chemical processes since it goes into great detail in the conversions of food into *Rasa* (plasma? 'tissue fluid'? cerebro-spinal fluid?), *Rakta* (blood), *Mansa* (soft parts), *Meda* (fat? Red-bone-marrow?), *Asthi* (bone), *Majja* (contents of bones, Brain?) and the *Shukra*, the germ-cell as aforesaid."

Here, there is no question of confession from Dr. Agasha regarding the impossibility of interpretting the old terminology. The use of the queries in his statement has nothing to do with any such confession. It is lack of knowledge which has led the I.M.A. to misconstrue it. In his memo of closely typed 9 pages he has nowhere indicated in anyway anything to substantiate what Dr. Sen Gupta has concocted to indicate "the scheme.... contains similar confession from Dr. Agasha regarding the impossibility of interpretting the old terminology".

Another glaring misquotation is from the same source. Dr. Sen Gupta misquotes Dr. Agasha as follows—"a large number of workers have devoted their time, money and energies to the causes of Indigenous Systems of Medicine.... nothing tangible had been achieved by the protagonist of these systems up to now." The following is the true quotation: "You are aware, sir, that large number of workers have devoted their time, money and energies to the cause of the Indigenous Systems of Medicine, some actually having made it their life's missions to put the theories of these systems on such a footing as to be appreciated by the masters of the western schools of thought. To that extent they have written many essays and have done what little they could toward the 'upliftment'—if it may so be called—of these systems. Individual efforts, however sincere and painstaking, are not expected to succeed in this sort of a vast field however, and it is not to be wondered at, that nothing tangible had been achieved by the protagonists of these systems up to now."

Just compare the misquotation with the true one and note the gulf of difference in the meaning.

I quote again, the remarks made by Dr. Agasha himself (April 1948) on Dr. Sen Gupta's misquotation. Dr. Agasha says, "The wonder is that these people who could misrepresent.... or at any rate misinterpreted a living writer within the short space of a year, should look very offended when others are candidly admitting that there is some inevitable confusion in the interpretation of texts written well-neigh 3-4 thousand years ago and therefore try to impress on the central committee and the Government, that these 'texts deserve a close scrutiny . . . and it is urgent to separate the chaff from the grain in this matter.' It shall, I hope, be seen by everyone who wants to study the whole problem dispassionately, how the removal of a few sentences from the context can give a totally different impression about the original meaning of the author, and I thank Dr. Sen Gupta again, for having provided me with a very excellent example how even people of his learning can misconstrue anything and leave, to quote his own words 'a mass of mutilation, adulterated and interpolated'. (Plain talk of I.M.A.'s memorandum of Indigenous System—by M. N. Agasha, published in Ayurmeemamsa—April 1948. Pp. 25-37).

Out of these 9 pages of memo submitted by Dr. Agasha to the Ch. C., I.M.A. could misquote only one passage and that only after gross disfigurement. Dr. Sen Gupta has also quoted another passage and that again grossly mutilated giving an impression just opposite to what is actually meant by the original writer.

Gananath Sen had been the most voluminous writer on Ayurveda during the last 50 years in the form of numerous books, presidential and other addresses. He has dealt with multifarious aspects of Ayurveda—literary, historical, organisational (teaching institutions, teaching) etc. Out of this voluminous literature Dr. Sen Gupta could find only 2 materials—(*i*) the controversy regarding some terms which took place in 1922 i.e., 30 years ago and (*ii*) only one ill-statement from the introduction to his 'Pratyaksha sariram'—*"Sharire Susrutonastah"* but Dr. Sen Gupta does not know that this statement of Gananath Sen has long been retracted. Neither Dr. Sen Gupta nor the I.M.A. could find any other statement of Gananath, worth mentioning, from his voluminous writings. Regarding the above statement of Gananath Sen, *viz.*, "bristling with inaccuracies of ages" 'Susruta is good for nothing in anatomy' quoted by the memo, I may draw the attention of I.M.A. to the foollowing statement of P. C. Roy regarding 'the purity of the text of Susruta'. Roy says, "Since a remote period the text of the Sushruta has been jealously preserved and no tampering with it tolerated. Thus Dallana refuses to recognise the authenticity of a passage, because an ancient commentator, Jejjata, has not noticed it.

अनार्षोऽयं योगः जेज्जटाचार्य्यण नाक्तत्वात्। तस्माद्न पठनीयम्

—*Chikitsa*, VII, 3.

Many such instances may be cited. For the purity of the text we are much indebted to these commentators."—P. C. Roy, Hindu Chemistry, Vol. I, p. xxxi-ii.

Dr. Sen Gupta states, "What remains today, is a mass of mutilation, adulterated and interpolated, containing some time-honoured drugs and medicine most of which are . . . and certain clinical aphorisms." This statement can only come from an arm-chair philosopher, eyes tightly bandaged but making a show that he is studying by having a book in his hands. I know no word to express the mischievous ignorance on the part of the framers of this document.

Not only Dr. Sen Gupta and the Memo, but the editor also has followed suit in misquotation and it is strange that the editor has attempted to smuggle it inspite of the fact that this is from a public document like Ch. C. report (Appendix p. 470). The editor states, "The scheme of giving a six months training to Vaidyas, *untrained previously in any institutional course of practical and didactic study* (Italics mine) and authorise them to undertake medical, surgical, and obstetrical relief in rural areas is not only foolish but fatal—according to modern values of human life. One cannot but gasp with wonder, therefore, when Dr. D. N Banerjee in order to utilise the existing Vaidyas in rural areas, as an immediate measure, submits seriously the following programme and remarks: . . ."

The subsequent quotation from Dr. D. N. Banerjee is undoubtedly correct, but there is a fly in the ointment. The editor has conveniently, and possibly intentionally, dropped from the above quotation only the following 3 relevent sentences occurring in between in order to put his words into the mouth of Dr. D N. Banerjee to mean that the latter wanted the Vaidyas untrained previously are to be utilised.

The full quotation of Dr. D. N. Banerjee's memo is as follows of which the three sentences printed in italics have been omitted conveniently by the editor, *J.I.M.A.*

"Just as an ordinary member of the public, having no previous training in medicine, can get training and official recognition as compounder, dresser, dai or sanitary inspector, an Ayurvedist, with knowledge in the art of healing, is better equipped for the study of these subjects and when given special training will undoubtedly be able to handle minor-surgery, midwifery and Public Health work more efficiently.

As personnel to the existing hospitals: the most suitable young Vaidyas of today, who might be competent to take charge of hospitals after a further training, may be selected. They may be given a refresher course for 6 months particularly in surgery, gynaecology, hygiene and preventive medicine, medical jurisprudence and toxicology and put in charge of hospital duties. *They must have practical training on operative surgery on the dead body, operative midwifery on dummies and minor operation on patients.* When placed in charge of hospitals as surgeons, they must be put as assistants for about 2 years and then put in independent charge.

The Syllabus—Entrance qualification· A passed student from an institute recognised by the Ayurvedic Councils of Registration of different provinces or states." (Ch. C. report-appendix, P. 470).

May I ask the editor, what business had he to drop these three sentences from the 4 contingueous paragraphs he has quoted from my memo to the Ch. C.? Is it only to malinterpret and that with a motive, my statement to force it to corroborate what the editorial wants to say "the scheme giving a six months training to *Vaidyas, untrained previously in any institutional course of practical and didactic study* (Italics mine) and authorise them . . ."

Ignorance of I.M.A. on the Science of Ayurveda

(a) In August 1947 (*Indian Medical Record*) I remarked that "the draft Memo gives out a gross misrepresentation of facts which are incorrect, misconceived and as such liable to prejudice the members of the I.M.A. most of whom are rather innocent of Ayurveda." (*b*) In Oct. 1947 (my Note of dissent to I.M.A.). I stated that "under Ayurvela of today (p. 7)" Dr. Sen Gupta states—"Ayurveda at present has got no scientific surgery, midwifery, gynæcology, pediatrics, juris, hygiene, pathology, bacteriology etc. It has neither scientific anatomy, physiology, pharmacology nor physics, chemistry and biology." This statement is a deliberate travesty of truth. From what little I have studied the Ayurvedic literature I can prove beyond all doubt that there exists at the present moment in the extant Ayurvedic literature a scientific surgery, pathology, anatomy, physiology, pharmacology, physics, chemistry and biology of a fairly high standard. (*c*) In March 1948, I had to make the same remark before the gathering who assembled to give evidence before the Ch. C. in Calcutta where the framers of the I.M.A. document, including the then president and one of the vice-presidents of I.M.A. and a host of Ayurvedists and Doctors were present. (*d*) In November, 1948 (*J. Indian M. A.*) and (*e*) Feb., 1949 (Ch. C. Report Vol. II p. 460) I repeated the same words.

I am glad that this statement of mine repeated *ad nauseum* by myself has at last aroused the I.M.A. from Kumbhakarnanian sleep after a full period of 2 years. I.M.A. for the first time has taken cognisance of my statement in the Editorial (June 49 issue) but has unfortunately added another statement, which again, presents ignorance of the editor on the science of Ayurveda. The editor's statement runs as follows: "The pity of it is that Dr. Banerjee cannot feign to be ignorant to the fact that there is not a single description of even any of the old and well-known diseases of India such as malaria, kala-azar, tuberculosis and filariasis, etc., that can be utilised at the present day for any purpose other than for studying and tracing the interesting evolution of the History of Medicine."

Let us quote the following from Garrison (History of Medicine p. 387) which speaks of itself. Garrison says, "Witness the Susruta's very recognisable description of *malarial fever, which is attributed to mosquitos* or the passage in the *Bhagavata Purana* which warns people 'to desert their houses when rats fall from the roofs above, jump about and die' presumably from plague. Evidences of variolation (inoculation against small-pox) have been found in the Sanskrit text Sacteya. attributed to Dhanwantari (p. 63). He says ayain, "Human inoculation of variolous virus is said to be mentioned in the Atharva Veda" (p. 387).

Now let me give my observation to the statement of Dr. Sen Gupta and the I.M.A. that there is no scientific surgery, etc. in Ayurveda.

(1) *Scientific surgery, midwifery and gynaecology* in Ayurveda—Dr. Sen Gupta has stated that there is no such thing in Ayurveda. One must divide the above subjects under two groups. (*i*) The science of surgery etc., and (*ii*) the art of surgery etc. There are hundreds of surgeons all over the world each having removed thousands of uterus, appendix, gall bladder or even brain tumours. We may classify them as masters of the art of surgery but most of them have not contributed a single line to the science of surgery. They are good technicians and this technical skill may bring tons of money to their pockets, but science of surgery is quite different. In Ayurveda of today it is a fact that there is no mention of the art of surgery, but a perusal of any character of Susruta will convince the impartial reader about the vast

amount of scientific surgery in it. And I commend the editor of Jl. I.M.A. to spend some time in studying Susruta. Of course, he shall have to overcome the stumbling block of *vayu, pitta and kapha,* a difficult task indeed.

(2) *Pediatrics*—In the words of Dr. Sen Gupta himself (Draft memo)—"In diseases of children—the work of Jivaka, Parvataka, Hiranyakksha etc., have not yet been found out." Let me inform him that "Vrddhajivakiya Tantra" or "Kasyapasamhita" the work of Jivaka, is before me at the time of writing this communication and this book is in print since 1938 *i.e.,* 12 years from today being the Nepal Sanskrit Series No. 1 and published by Nirnayasagar Press, Bombay. (Text pages 338. Introduction by Nepal Rajguru Hemraj Sarma P. 1-240).

(3) *Juris*—While toxicology (animal and vegetable poisoning) has been very elaborately described by Susruta in Kalpasthana (8 chapters), Arthasastra by Chanakya (also called Kautilya), gives us in detail the procedure in Kantakasodhan courts where post-mortem reports and other elaborate details are put forward in medicolegal cases. Of course we must not expect to find the multifarious medico-legal problems arising out of modern civilization.

(4) *Hygiene*—Let me quote Castellani and Chalmers (Tropical Medicine). They observe—"There is no doubt that the Indian doctors were well versed not merely in medicine and surgery but also in the prevention of disease and operative midwifery. Among the various remedies must be mentioned the fact that inoculation of small-pox was practised at the beginning of the warm season. Dietetics and toxicology were also well known. Hospitals were founded by Buddhist princes in India and Ceylon. In fact, there is an account of a hospital being founded in Anuradhapura, the ancient capital of Ceylon, as early as the 5th century B.C. and later many more were established, as well as a sort of medical or sanitary department, having one medical officer to every ten villages, together with a definite sanitary organisation and with institutions for the reception of cripples, deformed and poor persons". The last sentence is now of historical interest but the earlier comments are undoubtedly based on literature still extant and in common use.

(5) *Pathology*—Pathology is my own subject and I can speak on this from firsthand observation. From study on this subject I can assure everybody that I am convinced of what I have said elsewhere (Ch. C. Report Appendix p. 463). "The modern science in order to be modern, studies and incorporates in its corpus the truth whatever might be its source. The *Panchamahabhuta* theory—the fundamental principles of basic sciences of Ayurveda; the *Tridosha* doctrine—the basis of all branches of Ayurveda; the *rasa-veerya-vipaka* theory—the basis of pharmacology; the theory of *chaya-prasara-prakopa, dosha-dushya* union, the basis of pathology of diseases and the theory of *dosa-dushya* disunion and maintenance of equilibrium of the *doshas* as the fundamental principle of therapeutics, are bound to be studied by world scientists and I visualise that, a day will come, and that within a period of 10 years when the *tridosha* doctrine of Ayurveda—not the humoral theory of the Greeks—will dominate over modern conception of pathology and clinical medicine, just as bacteriology has played the greatest role on etiology and preventive medicine and antibiotics on therapeutics."

(6) *Bacteriology*—One may naturally feel curious whether it is at all possible to expect any mention of modern medical bacteriology in Ayurveda, only because bacteria have been discovered in 1687 for the first time. He will be astonished to find mention of bacteria under the term *krmi, raksha, skanda, putana, takman,* etc. An elaborate description of these microbes has been given by me in my paper 'Microbiology of the Hindus' (Cal. Med. Rev. April, May, June 1947).

(7) *Anatomy and Physiology*—I only refer to the reader my own works on 'Ayurveda Sharira'. One volume 'The nervous system in Indian physiology' has already been published and two other volumes 'Ayurveda Sharira' and 'Tridosa doctrine' are expected to be out in February, 1950. Regarding anatomy, I may quote Hoernle (Studies in the Medicine of Ancient India—Part I. Osteology, 1907). Hoernle remarks—"Probably it will come as a surprise to many, as it did to myself, to discover the amount of anatomical knowledge which is disclosed in the works in the earliest medical writers of India. Its extent and accuracy are surprising."

(8) *Pharmacology*—That Ayurveda of today possesses a very elaborate pharmacology is known to all. The I.M.A. is inconsistant and self-contradictory when it says in one breath that "Ayurveda of today has got no .... pharmacology ...." and in the same breath "Ayurveda and Unani systems have both lost all other departments of medicine except materia medica and medicine."

Now come the preclinical subjects—physics, chemistry and biology.

(9) *Physics*—The *Panchamahabuta* theory, the fundamental basis of Ayurveda, wrongly termed philosophy, is nothing but pure physics, elaborately dealt with in the line of approach of Ayurveda, of course, not in our modern scientific approach. This knowledge is essential before one attempts to study Ayurveda.

B. N. Seal in his "Mechanical, physical and chemical theories of the ancient Hindus (in P. C. Roy's History of Hindu Chemistry) and "Positive sciences of the ancient Hindus" (1915) has presented us with a detailed description of the Hindu ideas in mechanics (kinetics), acoustics, cosmic evolution atomic theory etc., etc., in terms of modern physical science. Darsana Sastras deal with doctrines demon-

strable. Darsana, thus, means a science. For this reason, Darsana sastras have been attributed as "the positive sciences of the Hindus." Seal says further (P. C. Roy's History of Hindu Chemistry, Vol. II p. 59)—"The Sankhya-Patanjala system accounts for the universe on principles of cosmic evolution, the Vaiseshika-Nyaya lays down the methodology of science, and elaborates the concepts of mechanics, physics and chemistry. The Vedanta, the Purva Mimamsa, and in a lesser degree, the Bauddha, the Jaina, and the Charvaka systems, make incidental contributions on points of special interest but their main value in this regard is critical and negative."

(10) *Chemistry*—The high standard of chemistry as elaborated in extant Ayurvedic literature and practised daily by the modern Ayurvedist has enamoured P. C. Roy, the greatest chemist in India. As regards practical chemistry he writes (History of Hindu Chemistry, Vol. I. Pp. xcvii-xcviii. and C)—"The knowledge in practical chemistry, prevalent in India in the 12th and 13th centuries A.D. and perhaps earlier, such as we are enabled to glean from Rasarnava and similar works, is distinctly in advance of that of the same period in Europe. It was known for instance that blue vitriol and a variety of the pyrites yielded an essence in the shape of copper, calamine and zinc. The colour of flames as a diagnostic test of metals was well understood. The metallurgical processes, described under the latter, leave little to improve upon and, indeed, they may be transferred bodily to any treatise on modern chemistry." "We have only to refer our reader to the chapter on the preparation of caustic alkali, in the Susruta, with the direction that the strong lye is to be 'preserved in an iron vessel', as a proof of the high degree of perfection in scientific pharmacy achieved by the Hindus at an early age. It is absolutely free from any trace of quackery or charlatanism."

(11) *Biology*—B. N. Seal (*loc. cit*) has also given a detailed and exhaustive account of the Hindu ideas about plants and plant life, on Hindu physiology and biology, fœtal development, heredity, sex question, life etc., all these from the extant Ayurvedic literature. Charaka and Susruta have mentioned thousands of different varieties of plants and animals and their detailed descriptions and the role played by them in producing and curing diseases. Girija Prasanna Majumdar has also given a detailed study of Ayurvedic botany. In addtion to the Ayurvedic treatise mentioned above, such treatises, *viz.*, Palakapya Samhita (on elephants), Salihotra Samhita (on horses), Gotama Samhita (on cattle), Vrikshayurveda (on plants), Garbhopanishada (on embryology), etc., all extant today, give us an idea of the high grade of knowledge of the ancient Hindus on biology in normal and diseased conditions.

I hope what I have given above is sufficient to convince Dr. Sen Gupta and his school of thought in my charge of gross ignorance on the part of the framers of I.M.A. documents when they say that "Ayurveda of today has got no scientific surgery...."

Questionnaire Issued by I.M.A.

This is another piece of document arising from the imagination of Dr. Sen Gupta. I can characterise this only by saying that this questionnaire instead of eliciting answers which would throw light about the valuable information available from the Ayurvedic literature, attempts to misguide the members of I.M.A. by putting comparison between Ayurveda and modern medicine and that again by drawing attention only to the defects of the former, and most of the questions are irrelevent. The drafting of the questionnaire itself also reveals miss Mayo mentality like the other statements of Dr. Sen Gupta.

Presidential Address of Ex-President

Now we give another instance which can undoubtedly be classified as *bona fide* conviction in the mind of the writer that Ayurveda is not scientific but the background of that is bequeathed of ignorance and when we heard the speech delivered, our minds have been taken aback by its colossal absurdity. This document is the presidential address of Col. Amir Chand delivered at the 24th All-India Medical Conference at Bombay 1947. He has given his definite personal views on indigenous systems of medicine and although we do not agree with him in most of his arguments, still we have nothing to remark here as that will be one personal opinion against another. But we do propose to comment as that has emanated from the head of our institution in his official presidential address. And further, he has betrayed the source of his knowledge and his critical review or implicit faith on the literature of his inspiration. His statement itself is self-explanatory. He says—"I have not formed these views without some study of the subject and I can assure you they are not the views of a prejudiced mind" and then he goes on with nonsensical gibberish, the result of his study, covering pp. 24-26 of his printed address. I do not want to waste printer's ink and the expensive pages of this Journal by quoting it in full, particularly as it has already tarnished its pages (J. I.M.A. April 1948 issue pp. 225-26).

It is amazing that while Dr. Sen Gupta and I.M.A. know only 4 or 5 books on Ayurveda extant at the present day out of so many hundreds as detailed above, Col. Amir Chand did not know any of them and a *nighantu* (properties of drugs) and one book titled, "Makhzani Ayurveda" had been the only books to inspire him. After hearing his address I rushed to the Ayurvedic book market to secure a copy of the above book, but it appeared that the Bombay market did not know the name of the book even.

It is all the more significant that this book had been so favourite of Col. Amir Chand that he preferred to lose the whole of his property but had this treasure with him to quote extensively from this book. Let me quote his own words on this aspect. He says about his presidential address—"I tell you that it was written by a homeless refugee lying, to all intents and purposes on the roadside, without any references at hand and with a distracted and perturbed state of

mind (p. 31). Still he had the laudable 'Makhzani-Ayurvaid' and the 'records of personal experience of an experienced vaid at hand to quote in extenso. Now two questions arise in one's mind (1) Is it a fact that Col. Amir Chand knew only these two laudable books as representing the whole range of the science of Ayurveda? If so, he can be accused of giving his opinion without any knowledge of Ayurveda, and that in a presidential address before the joint session of 8 medical conferences, Indian Medical Conference being only one of them. He, as the head of I.M.A., has thus acted in the most unscientific way and has degraded the institution before public eye. (2) If, on the other hand, it was in his knowledge that there are other authoritative books particularly Caraka Samhita and Susruta Samhita and that he had ever any opportunity to study them first hand; (but he has not mentioned that in any way in his address) one may be perfectly justified to characterise his address as that entirely to vilify Ayurveda.

Conclusion

A critical review of the five documents (four of the I.M.A. and the fifth the presidential address deiivered by the head of the institution) clearly shows that all of them are unscientific, preposterous and uncalled for, and as a member of I.M.A. I feel with disgust that they have caused a great degradation of the fair name of our institution. In this communication I do not propose to offer any threat to the I.M.A. which undoubtedly deserves to be so treated, for placing this very important scientific subject to incompetent persons, ill-acquainted with the subject and possessing rather mischiveous attitude which has brought the I.M.A., one of the most learned societies in India to disgrace. One can commend with equal force to the I.M.A. authorities in general and Dr. K. K. Sen Gupta in particular, the same expression which the British Health Minister Bevin levelled against Mr. Churchill on 29th Sept., 1949, during the Parliament's debate. The expressions are as follows:—"I welcome this opportunity of pricking the bloated bladder of lies," "I call on him to retire from public life if he could not help misrepresenting the situation." "It would be better for him not to tarnish his reputation any further", "an almost Goeblelistic system of mass suggestion had been evolved to try to persuade Britons (substitute members of the I.M.A.) that they (substitute Ayurveda) were far worse off than they really were. (This statement is particularly applicable to the qestionnaire issued by Dr. Sen Gupta); "He has 'subedited' history. If there were any disagreeable facts, overboard they went". (This is particularly applicable to the Editorial subeditting and throwing overboard 3 sentences from my suggestions to the Ch. C. re; 6 months' training to existing Vaidyas).

I do not approach I.M.A. with begging bowl in hand to show mercy to Ayurveda, as I do not hold any brief on its behalf and, on the other hand, Ayurveda does not require any such mercy. The caravan of Ayurvedic progress will proceed uninterruptedly heedless of what I.M.A. says or even inspite of I.M.A. I do, however, approach I.M.A. with bended knees, with the earnest request that it should behave like a scientific organisation with respect to a scientific subject to proceed scientifically and get rid of spreading incorrect and half truths.

I repeat again what I have said before (J.I.M.A. June, 1947). "It is my firm conviction, from what little I had been able to study Ayurveda that the present day available literature is still very rich and the basic medical sciences *viz.*, chemistry, physics, biology, anatomy, physiology, pharmacology and pathology in which we are particulary concerned at the present moment can undoubtedly stand the scrutiny of modern sciences. I draw the particular attention of the Working Committee of the Indian Medical Association to this as I feel that this is the proper authority to undertake this task. The teachers of modern medicine, if they study Ayurveda with a critical eye, are the proper persons to deliver the goods in the re-orientation of Ayurvedic doctrine, particularly in anatomy, physiology, pharmacology and pathology than the best trained orthodox Ayurvedist. For this reason, I believe that the teachers of modern medical sciences and as a matter of that the Working Committee of the Indian Medical Association, if they study Ayurveda, are the proper authorities to deliver the goods."

And I remind I.M.A.'s own words—"The Indian Medical Association is of the opinion that these so-called systems of medicine like any other system or branch of science should be examined and investigated with an open mind with a view to ascertaining their usefulness in the medical relief of the country, in the light of the latest available knowledge and information of medical science and the allied branches of biological and physical science." And I request it to undertake this examination and investigation and I am confident that this investigation will amply reward the I.M.A.*

* Unfortunately Dr. D. N. Banerjee has introduced a note of Chauvinistic and bellicose patriotism in a scientific discussion. After all his mud slinging at the I.M.A. in his lengthy retort he has only proved the I.M.A.'s case, namely that Ayurveda is a fertile field for research. He has failed to convince his readers how Ayurveda, its text books and manuscripts, can be taught as text books to students.

The I.M.A., the Indian Medical Council and the A.I.M.L.A. have unequivocally condemned cheap and substandard medical qualification—whether obtained in 6 months or 2 years, with or without autopsy as advocated by Dr. Banerjee.

The recommendation of Dr. Banerjee is neither in the best interest of the people and their efficient medical relief nor in the interest of the students themselves.

The only form of synthesis that is possible and feasible is what has been recommended by the I.M.A. and other scientific bodies of the country namely,—that modern scientific medicine should constitute the curriculum of study for the modern medical student and that as much of Ayurveda or Unani etc. as can stand the test of scientific investigation should be incorporated into the same.

To quote his own words—"The real worth of Ayurveda must be assessed first" (Chopra Report p. 469). We have already drawn pointed attention to the inexplicability of old Ayurvedic nomenclature and technical terms and may refer again our readers to M. M. Kj. G. K. Sen's learned thesis on 'Sanjna-panchaka-bimarsha'. The writer's language and remarks against the then president of the I.M.A. is not becoming of him.—Ed. *J. Indian M. A.*

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POLIOMYELITIS

Poliomyelitis, like rheumatic fever was thought to be a disease of the temperature climate and McKhann and Wilson wrote: "Poliomyelitis is a disease of temperate climates and is infrequently encountered in tropical countries."[1]

If we take it for granted that their observations were correct, then the last epidemic may have a sinsiter significance. Was there anything which used to prevent the virus thrive in the tropics which has now been removed? Or has the virus undergone some change so that it can now withstand the tropical climate with impunity? Or, the whole thing is nothing but a panicky reaction of a few doctors who have suddenly become conscious of a disease which used to occur sporadically in India? In any case, in no epidemic in America, more than 2-3 per cent of population were affected, and only a small percentage of them developed residual paralysis. In this connection we draw the attention of our readers to our opinion.[2] All the same, it is necessary now to be alive to the problem as with early treatment some amount of recovery is possible even in the worst cases.

Poliomyelitis is a virus disease and the present-day conception is that the virus enters through any portal along the gastro-intestinal tract, usually, from the midgut. The virus is picked up by the gray-fibred peripheral nerve-endings of the autonomic nervous system and travels directly to the spinal cord or midbrain by way of the axis cylinders. Axis cylinders are immune and the virus only attacks the cells. Toomey[3] has likened "the virus" to "a river overflowing its banks. If there is a minor flood, the virus covers merely the immediate low lands (lumbar area); if a greater one, it backs up and inundates higher territory (cerivcal area) as well. Again, the flood may be so great as to affect distant areas (bulbar area). It may also course over the seventh, ninth and tenth nerves to the bulb."

Sabin[4], however, does not confirm Toomey. In a well-reasoned article he says, "the available bioassay and pathological studies . . . only serve to exclude the olfactory system and the blood stream as possible pathways of the virus and to suggest that the cervical and abdominal sympathetic nerves are infrequently if ever used as pathways for invasion of the central nervous system." As a matter of fact, the pathway of spread in the body remains undecided.

Sabin *(loc. cit.)* brings forward two more points: (1) immunologically the poliomyelitis virus is not one and (2) the difficulty in deciding the method of spread in the community. From epidemiological point of view the last point is very important. At the present moment there are three theories regarding mode of spread: (1) respiratory, (2) digestive, (3) digestive and through the medium of non-biting flies. None of these are convincing. But a few facts have been established that (*a*) during an epidemic, tonsillectomised children suffer more than others, (*b*) in densely populated countries with primitive sanitation poliomyelitis infection is more widespread than elsewhere, and (*c*) the disease reaches its peak during summer when the flies abound. Prophylactic measures should be based on these facts. No child should have his/her tonsils operated when there is an epidemic of poliomyelitis and everybody should be careful about his/her food and sanitary habits.

The diagnosis, however, must be made on clinical grounds as no laboratory tests exist for the diagnosis of poliomyelitis. Here we should draw attention to the note by the Ministry of Health, England, issued during the last epidemic in 1947, which was printed in this Journal.[5] Furthermore, one must be ready to recognise atypical forms, which are quite likely in view of Sabin's contention that poliomyelitis virus consists of a group of viruses. If during an acute infectious fever, a child or a young adult develops stiffness of the neck or of the spine, suspicion should be aroused. It is very difficult to be dogmatic about diagnosis where no sure signs exist. Toomey gives the following criteria of diagnosis:

"(1) A diagnosis must not be considered absolutely proved in the absence of positive findings in the spinal fluid.

"(2) No persons with paresis or paralysis of the muscles should be considered having poliomyelitis if the involvement is not segmental.

"(3) The lesion in this disease must have the characteristics of a lower motor neuron lesion.

"(4) Despite the presence of paralysis, no persons with distinctive sensory findings (dissociation of temperature, pain, sense, etc.) or signs of an upper motor neuron lesion should be considered as having poliomyelitis."

Poliomyelitis is to be distinguished from contagious diseases, rheumatic fever, influenza, encephalitides myotonias, acute arthritides, peripheral 'neuropathy' or neuritis.

A suspicious case should be isolated as the patient is most infective in the pre-paralytic stage. Rest in bed and when respiratory muscles are involved, rest in an iron lung is to be instituted.

The virus is present in the throat of patients in the acute stage, in the fæces in all stages. The incubation period is from 7 to 14 days or longer. A second case in a family is very uncommon.

Closure of day schools is not necessary, residential schools require more attention. Hasty closure of schools should not be ordered. Public baths and flies should be controlled.

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[1] McKhann, C. F. and Wilson, J. L.—Brennemann's Pediatrics, **2** Chapter 15, P. 1, 1948.
[2] Editorial, *J. Indian M. A.*, **19**:23, 1949-50.
[3] Toomey, J. A.—*Am. J. Dis. Child*, **66**:635, 1943.
[4] Sabin, A. B.—*Ann. Int. Med.* **30**:40, (Jan.), 1949.
[5] *J. Indian Medical Association*—**19**:24, 1949-50.

CURRENT TOPICS

I

FATS IN NUTRITICN

A conference of the Nutrition Society on "Triglyceride Fats in Human Nutrition" was held in the medical school of Birmingham University on October 15, with Sir Leonard Parsons, F.R.S., presiding.

Professor T. P. Hilditch spoke on the chemical constitution of natural fats, which were all complicated assortments of mixed triglycerides. In the formation of individual glyceride molecules a principle of even distribution of fatty acids between the glycerol molecules usually held good; no fat molecule contained two radicles of any particular acid unless all the other molecules contained at least one radicle of that acid. The compositions of certain animal fats, however, did not appear to obey this rule. Thus beef and mutton fats contained glycerides with more than one radicle of stearic acid in greater amounts than might be anticipated. Human depo fat contained 24 per cent of palmitic acid, 8 per cent of stearic acid, and 3 per cent of myristic acid as its saturated components, with 47 per cent of oleic acid, 5 per cent of palmitoleic, 10 per cent of acids of the linoleic type, and 3 per cent of C_{20-22} acids as its unsaturated components. Liver glycerides differed in composition both from the storage fats of the same animal and from the corresponding liver phosphatides. In some animals the milk fat closely resembled the depot fat, but in others it differed in containing large amounts of short-chain acids. Human milk fat was unique in containing lauric acid and a little capric acid, but no acids of lower molecular weight.

The ability of animals to synthesize fats from carbohydrates had long been recognized. Recently the synthesis of palmitic, stearic, palmitoleic, and oleic acids had been proved, but it remained doubtful whether other acids could also be produced. Dietary fat might be absorbed by the animal, provided that it melted, or at least softened, at body temperature, but it was uncertain whether an animal could utilize fatty acids which did not usually occur in its body even if they were ingested as glycerides of low enough melting point. The inclusion of vegetable fats in the diet might alter the composition of the animal's depot fat, but acids of low molecular weight were not stored. Vegetable fats varied greatly in composition, some being almost saturated and others highly unsaturated. Marine oils were usually characterized by the presence of large amounts of unsaturated C_{20-22} acids. In artificially hardened fats, as used for the manufacture of margarine, only some small amounts of doubly unsaturated acids were present, since the hydrogenation process first reduced all the acids to single unsaturated linkages before completely saturating the acids first attacked.

Dr. P. Kraut said that the production of artificial fats from acids formed by the catalytic oxidation of petroleum had been studied in Germany at various times since the first world war. The crude acids so produced differed from those of natural fats in containing equal numbers of odd and even carbon chains, in the absence of unsaturated components, and in the presence of dibasic acids, branched chain acids, alcohols, aldehydes, and various other contaminants. Dibasic acids did not appear to be injurious, but the removal of the other impurities was a tedious procedure. Although by repeated purifications it had been possible to produce tasteless fat which appeared to be innocuous when given in small quantities to experimental animal and man, the high cost involved was only justifiable in time of war. In any case the general use of artificial fats in human nutrition could not be recommended without further extensive feeding trials.

..*Study of fat Absorption.*—Dr. J. M. French outlined methods for the qpantitative and qualitative investigtion of fat absorption. To find the amount of fat absorbed from the intenstines the faecal excretion of fat must be balanced against the dietary intake over a period of at least three to five days. For estimating the efficiency of absorption a standard diet containing 50 g. of fat daily was usually given, but sometimes 100 g. or more was included. Useful information could often be obtained by changing the quality of the dietary fat,, particularly by increasing its content either of saturated short-chain acids or of unsaturated fatty acids. To elucidate the nature of defects in fat absorption it was often instructive to compare the qualities of the dietary and faecal fats, and for this purpose estimations of molecular weight and iodine value were useful.

In order to understand changes in the mechanism of fat absorption the intraluminar, cellular, and distributive phases must be considered. During the intraluminar phase fat was prepared for absorption partly by hydrolysis and partly by fine emulsification. In the cellular phase it passed through the intestinal cell, probably undergoing further modifications involving phospholipoid formation. In the distributive phase it left the intestinal cell and was either carried by way of the lymphatic vessels, the throacic duct, and the systemic blood stream into the fat depots, or alternatively by way of the portal blood stream into the liver. The choice between these two routes depended on the degree of hydrolysis. Short-chain acids, which were readily detached from their glycerides, were mainly absorbed in a non-particulate, molecularly dispersed form in aqueous solution by the portal route; long-chain triglycerides, which formed a large part of the normal diet, were absorbed in particulate, emulsified form by the lymphatic route.

To find whether ingested fat underwent normal intraluminar changes specimens of the intestinal contents of patients could be withdrawn by means of a Miller-Abbot tube; the degree of dispersion and stability of the fat particles could then be examined, and estimations made of amylase, lipase, trpsin, lysozyme, and phosphatase. Tests of the efficiency of particular absorption could be made by giving a long-chain triglyceride as a test meal, and by examining the resulting systemic lipaemia three hours later by means of the chylomicrograph or by microchemical estimations of fatty acids. When it was suspected that defective particulate absorption was accompanied by an increased absorption of fatty acid by the portal route, decreased

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gastric acidity and motility should be looked for, and also the possibility of excessive mucus formation in the small intestine should be investigated. In checking nomal functioning of the intestinal cells their power to absorb substance other than fat might be tested; the rate of disappearance of glucose when introduced in small amounts into the intestine often provided useful information. Excessive carbohydrate fermentation could be detected by estimating the increased amounts of volatile acids present in the intestines.

Dr. H. G. Sammons then described an ingenious apparatus by which it was possible to estimate the amount of fat present in a few drops of blood.

Types of Defective Fat Absorption—Professor A. C. Frazer, whose article on "Fat Metabolism and the Sprue Syndrome" appeared in Brit. M. J., **2**:769, 1949, discussed normal and abnormal fat absorption in the human subject and its nutritional significance. He said that normal subjects absorbed 95 per cent or more of their dietary fat, but two types of defective absorption could be recognized. First, a deficiency of bile or pancreatic secretion might cause only 10-20 per cent of the ingested fat to be absorbed. The faecal fatty acids were then found to resemble those of the dietary fat in composition, there was no evidence of abnormal gastric secretion or motility, and if the fat content of the diet was raised there was no corresponding increase in the absolute amount of fat absorbed. Secondly, patients who appeared to have a normal biliary and pancreatic secretion were often found to be able to absorb only 50-70 per cent of their dietary fat. The faecal acids were particularly rich in long-chain components, gastric secretion and motility were abnormally low, and an increase in the dietary fat was usually accompanied by a rise in the absolute amount absorbed. In this second type of defect, in which reduced particulate absorption was presumably associated with normal non-particulate absorption, the failure of acid formation in the stomach made the pH of the small intestines much less subject to sudden changes. In these circumstances bacteria were able to thrive at abnormally high intestinal levels, which allowed them to hydrolyse fats, ferment carbohydrates, and utilize nutrients such as nicotinic acid, riboflavin, and folic acid in competition with the normal metabolic processes of their host. The whole pattern of intraluminar activity might thus be changed, and minor digestive delays or embarrassments might become of major importance in precipitating secondary nutritional deficiencies.

Intravenous Alimentation—Dr. J. J. Elkes described attempts to prepare fat emulsions suitable for use in intravenous alimentation. Besides being physically and chemically stable such emulsions should be compatible with protein and glucose for simultaneous administration, and should not cause pyrogenic or local reactions. Physicochemical experiments indicated that to promote stability the fat particles and the protein of the emulsifying medium should have similar electrical charges. Promising preparations had been obtained with olive oil emulsified with either diluted blood plasma protein or a combination of dextran and soya bean phosphatides.—*Brit. M.J.*, **2**:978, 1949.

THE NEED FOR SHORTENING SCIENTIFIC PAPERS

Walter C. Alvarez, M.D., Division of Medicine, Mayo Clinic, writes:—

There has always been a need for shortening papers, but today this is becoming acute. With the soaring costs of printing and production, editors and publishers of journals are being compelled to cut down the number of pages per volume. A journal which, in 1947 made money may today be facing a deficit.

Another difficulty is that today no man can keep up with all that is being published, even in his speciality. Under these circumstances, the writer whose papers are most likely to be read is the one who makes them short and interesting. If he interrupts his text with boring material, many readers will quickly turn over the pages to the next article.

Today, the ablest physiiians, whose attention all writers want most to attract, are in the habit of quickly skimming through large numbers of articles, looking always, for one thing, and that is something new, significant, important and usable. Without any of the accompanying rehash, this grain of wheat could usually have been reported on a page or two.

A good writer edits his writings as ruthlessly as he would those of a stranger. Sometimes, in order to do this the better he puts a paper away for a month or two until he can look at it dispassionately, and then he will wonder how he could have written such stuff.

Fortunately, most papers are not injured by shortening; they really are improved, and the author is benefited. Recently, as I sat in a hall in Atlantic City and heard man after man present a good paper in ten minutes, I thought of medical conventions thirty years ago, when the reading of papers took from thirty to ninety minutes. I am sure the authors then did not make as good an impression as many do now.

Long introductions are bad—A writer is wise to leave out long introductions. Usually all that is necessary is a brief testament to the effect that there is a need for certain information to fill a gap in the world's knowledge, or to settle a controversy. The writer will then say that he thinks he has filled the gap or helped to settle the controversy. In other cases, he will say that he has discovered something new, or tried a new drug, or described a new syndrome. Only occasionally need he mention much of the history of his subject. This sort of thing is best done in a review article.

The worst thing a man can do is to write pages of introduction filled with tiresome statements the truth of which everyone knows, such as that the etiology of the disease under discussion is obscure and that some have said this and some that, without getting anywhere. Nothing should be left in that might cause

a reader to lose interest and stop before he gets to the meat of the article. The ablest writers try at the start to so grip the interest of the reader that he will want to go on and see what was done and found.

On holding the reader's interest—Having excited interest the writer will try to hang on to it. The last thing he will want to do will be to put in extraneous or uninteresting material which will cause the reader to give up.

Many writers discourage their readers by inserting early in the paper a page or two on needless statistics or on the technic used. Sometimes information as to technic is needed at the start to give the reader an idea of what was done, but at other times the details will be of a type that will not interest any one except those few men who are doing research in this field and who may want to repeat the experiments or to see wherein these differed from some that were done before. A wise writer will then put these details in an appendix at the end of his article where they will not interrupt the flow of the argument.

On not including foreign matter—No material should be put in which is foreign to the topic. For instance, a man writing on terminal ileitis should not incidentally describe a new operation which he has devised for making an artificial anus, and then not mention this in the title. *Anything published without a title which will be well listed in the Quarterly Cumulative Index Medicus is buried and lost.* For instance, Jacobi, who discovered the interesting reverse peristalsis in the right side of the colon, buried his note on it in an article on colchicum poisoning.

Many a discussion of the literature with a large bibliography should also be left out. It would be better wither to say that a bibliography of several hundred titles is to be found in a recent article by so-and-so, or to write a separate review article.

Big tables should usually be left out because so few readers stop to study them, and the cost of setting them is great. Oftentimes the data in several tables could, with great advantage, be shown in a graph or two or could be summarized in a couple of sentences. The reader does not want to have to stop and dig out the information; he wants it epitomized and given him by the author.

On avoiding long discussions with much theorizing—The discussion of the data should often be short. Efforts to explain phenomena as due to blockage or stimulation of one or other set of autonomic nerves usually do not help mech and do not do the author credit. It will be better to report the findings and let future research show what their significance was. Often a writer, by his dogmatic statements and questionable interpretations and theorizings, only antagonizes those abler readers whom he would like most to impress favourably.

On making a good summary—The summary should be written with particular care, because today most readers and most abstracters read only this part of an article. When a writer fails in his summary to mention all the important things he found, he found, he cheats himself.

On shortening case reports—Most case reports could be shortened with advantage. Let us say a man studied a case in which a colonic diverticulum ruptured into the stomach. This might be worth a report, but it should not run fourteen or twenty pages. All that is needed is to tell briefly what the symptoms were *which might perhaps be attributed to the lesion.* No one wants to hear about the man's varicose veins, his hernia, or his bunions. The writer need mention only those *essentials in the history and findings* which led to the diagnosis—if it was made before operation or death. The findings at operation or necropsy should, again, be described briefly, with all extraneous matter left out. The readers will not care to know just when the patient was admitted to the hospital, what doctor sent him in and what his family was like. Neither will they want to know about the findings which had no significance, such as cervical ribs, a small varicocele, or a hypertrophied prostate.

Many a young clinician seems too anxious to impress his fellows with the thoroughness with which he works up his cases; all he really succeeds in doing is to bore them. In purely medical reports many a writer tells even what anesthetic was used at the operation; just how the abdomen opened and closed, and how many liters of salt solution were given during convalescence. Who wants to know those details? Similarly, in the report of the necropsy, who wants to know the details about the whole body? In our hypothetical case, readers will be interested in perhaps two things: (1) how the diverticulum came to rupture into the stomach, and (2) how they might recognize a case of this disease if they ever were to see one.

On rewriting—There probably never was a good paper which was not worked over several or many times. The writer will do well to search through his pages for every sentence and word that can be deleted without taking from the essential message. Every sentence that is vague should be rewritten until it can have but one meaning and that an obvious one. Finally, the writer who would have his papers widely read will do well to use, when possible, the short Anglo-Saxon word rather than the long one of Latin or Greek derivation. This makes for easier reading; and the tried doctor, when he comes home at night from what he hopes is his last call, much appreciates easy reading, with simple English words and short and simply constructed sentences.—*Proc. Staff Meet. Mayo Clinic,* **24**:442, 1949.

THE CARE OF OLD PEOPLE

Representatives of nearly three hundred voluntary organizations and of nearly as many local authorities assembled at Friends House, London, for the fourth annual conference of the National Old People's Welfare Committee, which works in association with the National Council of Social Service. One subject for discussion, under the chairmanship of Sir Ernest Rock Carling, was the employment of old people, and an open forum was held on matters affecting old people's welfare.

At the opening session Sir William Douglas, Secretary of the Ministry of Health, addressed the conference on what has been planned and achieved by local authorities and voluntary bodies since the passing of the National Assistance Act, 1947. After mentioning that in that year the total number of people of pensionable age was 13·7% of the population, Sir William Douglas discussed methods of encouraging old people to continue to live an independent life for as long as they could, and the importance of ensuring that old people who could not look after themselves would be cared for with kindness and understanding.

The withdrawal of old people from normal community living, he said, should be postponed for as long as possible, and geriatric treatment had helped towards this desirable end. For the most part the 95% of old people living by themselves or with their families did not want to be thought of as segregate from the community, but if they were to continue to lead an independent life some consideration must be given to their special needs, especially in the matter of housing. Too many old people were living at the top of high buildings others in large houses where they had formerly brought up families. Some local authorities had provided bungalows and flats specially designed for the aged, but much remained to be done in that respect. The Ministry of Health was encouraging local authorities to include in their programmes houses of varying size. The Housing Act, 1949, enabled Exchequer assistance to be given to housing authorities for the provision of hostels for those who no longer required or desired a separate home of their own. He feared that a long time must elapse before an adequate number of old people's dwellings could be built.

To ensure that old people got adequate meals various provisions were made, notably the "Meals on Wheels" service. The Women's Voluntary Service were serving 50% more meals from their centres than was the case a year ago. Civic restaurants would arrange for meals to be taken round their districts. The Ministry of Health would grant sanctions for loans to enable local authorities to buy vehicles and equipment for this service. The movement to establish old people's clubs had been greatly facilitated by grants under Section 31 of the National Assistance Act. Up to last July there were 1,800 such clubs.

There had also been a large extension of the home help service, offering unlimited scope for voluntary effort in helping old people. Many of them, too frail to leave their homes, appreciated help with shopping and certain household work, or just a friendly visit, with any desired advice on their personal difficulties. For old people who could no longer live a wholly independent life some residential homes had been established, at which the weekly minimum charge was 21s. Subsidies were available for the building or acquisition of houses suitable for this purpose.

As for the bedridden, Sir William Douglas said that he looked forword to the day when no old person would be condemned to bed in the casual manner which had obtained in the past. Each such case should be carefully examined and considered from the point of view of the possible restoration of function. Some, of course, must always remain in the care of the hospital service, requiring constant care and supervision. It was very important to give them a sense of security; they should not be removed from one establishment to another except on strong medical grounds. It was difficult to escape the conclusion that some special accommodation for the aged infirm would have to be provided.—*Brit. M. J.*, **2**:978, 1949.

REHABILITATION OF THE DEAF

In a postgraduate lecture delivered at the Institute of Larynology and Otology in London Dr. S. Richard Silverman, director of the Central Institute of the Deaf, St. Louis, Missouri, began with the remark that, "with all due respect to my otological friends, the fenestrators, the irradiators, and the puffers and squirters," there was very little, medically and surgically, that could be done for the deaf; yet the otologist had great opportunities in dealing with the problem of the deafened. In the United States many factors had caused a recent surge of interest in this subject. Among them were the rapid developments in the science of electroacoustics; the evolution of different surgical techniques, particularly the fenestration operation; new investigations into the physiology of heading, despite the glib expositions in the textbooks, it was not yet known how the ear worked or how sound was converted into a nervous impulse; the popularity of motion pictures and the radio; and, finally, the tendency for "peripheral workers" (meaning politicians, social workers, and psychologists) to come together to do something for war casualties.

Hearing-aids—The greatest help offered to the deafened person was the vacuum-tube hearing-aid. There were two types of deafened persons: one requiring amplified sound, and hearing better when the voice was raised, the other able to hear speech of ordinary loudness but not able properly to distinguish syllables. With this second type, mere amplification only intensified the babel. The majority of persons who had purchased hearing-aids and discarded them belonged to this second group. On the other hand, certain people even in this category could be helped by a hearing-aid.

He had been quoted as saying that audiometers should be thrown out of the window, but that was a misinterpretation. The audiometer was a valuable instrument, but its limitations must be remembered. It could help in deciding in a given case whether a

hearing-aid would be useful and to which ear it should be fitted. Broadly speaking, if a person had a loss across the speech range of 30 to 35 decibels or more in the better ear the use of hearing-aid should be considered. Putting aside cosmetic considerations, statistics would show that about 90% of patients needed air conduction instruments and 10% bone conduction.

No hearing-aid was perfect, and no hearing-aid could enable a person to hear as though he had normal hearing. Auditory training for the user of a hearing-aid must be insisted on not merely in manipulating the instrument but in obtaining what the lecturer called "cerebral reorientation" to speech. The user of a hearing-aid must learn to listen. Three levels of hearing might be defined: the primitive level, at which the person knew there were sounds but was unable to differentiate them; the awareness level, exemplified in the person about to cross the street; and the highest level, as shown in the exchange of speech. One of the most common expressions among deaf ex-Servicemen was that the world had gone dead; there was an eeriness in not hearing the traffic in the streets or the wind in the trees, and even at the primitive level to get some kind of sound appreciation was helpful.

Lip-reading—Dr. Silverman believed in the value in lip-reading, or "speech reading" as it was called in America. There was not much correlation between native intelligence and ability to lip-read. Many intellectual people—people in the professions—were poor lip-readers. Dr. Silverman tried an experiment on his highly educated audience. He wrote on the board the words "bat", "man", and "pan", then moved his lips without sound, and asked his audience which word he had pronounced. Opinion was about equally divided between the three words, and then he explained that they were all right and all wrong, because in the movement of the lips there could be no distinction between the three. Lip-reading was of value because it evoked some effort from the patient. Too often people supposed that treatment was something which was to be done to them. But rehabilitation, with hearing as with other things, was not effective unless the patient got hold of the idea that he was doing something for himself.

In addition to hearing-aids, auditory training, and lip-reading, one other thing was essential—namely, speech conservation or correction. The ears were the governors of speech. With impaired hearing speech began to deteriorate. He regretted to find in England speech correction so far divorced from the organization for helping the deaf. Finaly, if hearing could not be improved or corrected, at least the patient might be taught to live with his disability graciously. Otologists and others often became so engrossed with decibels and frequency responses and articulation tests that they forgot that the patients themselves were not particularly interested in these things. The adjustment of the social and emotional life to the hearing defect was the important thing. The otologist should remember that the person who was hard of hearing was a person with a defective ear—not an ear with a person attached to it.—*Brit. M. J.*, **1**:862, 1949.

NOTES AND NEWS

NINTH ALL-INDIA OPHTHALMOLOGICAL CONFERENCE, LUCKNOW

The All-India Ophthalmological Conference will be held in the King George's Medical College, Lucknow on the 2nd, 3rd and 4th March, 1950 instead of, on 23rd, 24th and 25th February on 1950, as previousy announced. Those who are interested should communicate to the Hony. Secretary Dr. Satya Pal Gupta, F.R.C.S., D.O.M.S., Eye Surgeon, Medical College, Lucknow.

BIBLIOGRAPHY OF SCIENTIFIC PAPERS

One of the functions of the Field Science Co-operation Office of UNESCO in South Asia is to facilitate exchange of scientific information both within the region and with the outside world. During the 16 months of its existence, the office handled more than 200 requests. A large number of these requests are for information on scientific literature and publications. Because of the limited circulation these publications are not readily available to scientists in other parts of the world. Not infrequently even the existence of a paper is unknown and in this way some notable contributions to scientific knowledge may be obscured. A rough estimate shows about 10,000 scientific papers appear in this region every year. So far no comprehensive bibliography or documentation has been made of them. In order to fill this need the Field office proposes to compile a regional scientific bibliography to be distributed among the institutions and the outside scientific world through the other Field Science Offices of UNESCO, the International Scientific Unions and the leading abstracting services. It is hoped that such a bibliography will serve to increase the exchange of scientific literature and will enable the world to derive more benefit from contributions of this region. To start with, it is proposed—

(*i*) that the bibliography is to be published annually with supplements whenever necessary.

(*ii*) that only the titles, authors and references of the scientific publications will be given and no abstract will be attempted at present,

(*iii*) that all branches of pure and applied sciences (Medicine, Agriculture, Engineering) as well as social, historical and educational aspects of science will be included.

(*iv*) that only scientific publications published in this South Asia region (Afghanistan, Pakistan, India, Ceylon, Burma, Thailand, Malaya, Indonesia, etc.) will be included.

(*v*) that emphasis will be given to reports of original experimental work. books, monographs, reviews, surveys, annual reports etc., will be included whenever possible.

Co-operation is solicited of all scientific organizations and individual scientists of this region to make the bibliography as complete as possible. Scientists are cordially invited to send their reprints, reports, or other publications which are not readily available to enable the Science Co-operation Office for South Asia at Delhi University, to make the project a success.—Science & Culture, **15**:153, 1949.

ON SHORTENING SCIENTIFIC PAPERS

There has always been a need for shortening papers, but to-day this is becoming accute. With the soaring cost of printing and production, editors and publishers of journals are being compelled to cut down the number of pages per volume.

To-day no man can keep with all that is being published, even in his speciality. Under these circumstances, the writer whose papers are most likely to be read is the one who makes them short and interesting.

A good writer edits his writings as ruthlessly as he would those of a stranger. Sometimes in order to do this the better, he puts a paper away for a month or two until he can look at its dispassionately, and then he will wonder how he could have written such stuff.

Most papers, are not injured by shortening, they really are improved, and the author is benefited. A writer is wise to leave out long introductions. Usually all that is necessary is a brief statement to the effect that there is a need for certain information to fill a gap in the world's knowledge or to settle a controversy. The writer will then say that he thinks he has filled the gap or helped to settle the controversy. In other case, he will say that he has discovered something new.

The experiences of the editors with authors indicate a general willingness to follow the suggestions of the editors; here and there they come across an obstinate author who insists that his manuscript is sacrosanct. The author who refuses to co-operate suffer the greatest loss, for the busy scientist soon learns to ignore the verbose writer.—(*Chemical and Engineering News*, 1949, p. 2681, Ref. *Science & Culture*, **15**:233, 1949).

IONOSPHERIC INVESTIGATIONS AT CALCUTTA

Ionospheric apparatus, made in Australia has been loaned to the Calcutta University by the Commonwealth Scientific and Industrial Research Organization in recognition of the research work carried out by the University in this field. At present most countries are conducting research into the conditions in the ionosphere—the region of the upper atmosphere, about sixty or seventy miles above the surface of the earth.

The apparatus will be installed at Haringhata, about thirty miles from Calcutta. The Indian Council of Scientific and Industrial Research has made a grant of Rs. 80,000/- for the construction of the field station. Calcutta University, in collaboration with the Indian CSIR, will train about a dozen students in the technique of ionospheric investigation each year.—*Vijnanan-Karmee*.

RAJASTHAN ACADEMY OF SCIENCES

The Rajasthan Academy of Sciences was inaugurated in Pilani on 27-11-1949 by the Hon'ble Shri Siddharaj Daddha, Minister for Industries and Commerce, Rajasthan. The Hon'ble Shri Phoolchand Bafna, Minister for Local Self-Government, and the Hon'ble Shri Narsing Kachwaha, Minister for Labour, were also present on the occasion. The Academy has been started to uphold the cause and progress of science, both pure and applied, in Rajasthan. It shall in due course publish a journal including articles of original research.

At a meeting of the "Foundation Fellows" of the Academy, Shri M. L. Schroff, was unanimously elected as the President of the Academy for 1949-50, Dr. B. N. Mulay, as its Vice-President, and Shri K. R. Ramachandra, of the Department of Botany, Birla College, Pilani, as its Secretary.

DOCTORS AND HEALTH EDUCATION

Doctors, nurses and public health workers in India have no more vital responsibility than that of educating the people in healthier ways of living. This was the main theme of an address given to students and professors of the Lady Hardinge Medical College in New Delhi by Miss Helen Martikainen, WHO expert consultant in Health Education, who has just finished a tour of Indian health centres in Mysore, Madras and Calcutta under the auspices of the World Health Organization.

It was not necessary, in Miss Martikainen's opinion, to wait for a high degree of literacy before beginning health education work, and this belief had been strengthened by contacts made at the recent UNESCO Seminar on Rural Adult Education in Mysore and by talks she had had with Indian Health workers and educationists during her tour.

The United States also, she assured the students, had its problems and serious problems, of illiteracy, poor housing and bad sanitation. But experience there had shown that there were limits to the health education value not only of the written word, but also of films, posters and other visual media generally employed in trying to persuade people to change their health habits.

Miss Martikainen declared her conviction, which had been deepened by the contacts she had made in India, that person to person contact accompanied by demonstration always remained the best and most effective method of health education.

"It is of little value," the speaker went on, "to shoot pamphlets, posters and even films at people who have not themselves an interest in and a feeling of responsibility for their own health betterment."

In recent years and in many countries, according to Miss Martikainen, voluntary health agencies had been in the vanguard in awakening a feeling of community responsibility for health education. Other steps had been the inclusion of sanitation and hygiene in the curricula of teacher's training colleges, giving increasing importance to public health instruction in medical courses, and training doctors and nurses in teaching methods. In some places in the United States medical men had banded together in a concerted effort for community health education.

In India or elsewhere, the speaker insisted, health education must in the first place depend upon personal guidance by responsible leaders of the community. She concluded "The doctor, in his role of family teacher, counselor and guide, the nurse trusted by her patients, and the public health visitor whose influence is enormous, have unparallelled opportunities and a sacred responsibility for undertaking such basic person-to-person, health teaching."—*WHO Press Release.*—

MATERNAL AND CHILD WELFARE

The four-day symposium on Maternal and Child Health at New Delhi at its closing session on Jan. 2, 1950 adopted a blueprint for the co-ordination and development of public services for the care of mothers and children in India.

The symposium was convened by the regional office for South East Asia of the World Health Organization. Rajkumari Amrit Kaur, India's Health Minister presided over the session.

The blueprint contains detailed and practical recommendations drawn up by more than sixty doctors and health experts from all over India, attending the symposium. The recommendations cover organization and administration of maternal and child health, personnel training for doctors, nurses, midwives and dais, statistics, research, legislation, health education and school health.

The scope of maternal and child health services as laid down by the symposium includes the health of the mother and of the child from birth to adolescence at home, at school, at work, and in industry, as well as the care and rehabilitation of the handicapped and unwanted child.

The experts were unanimous on the need to integrate preventive and curative aspects of medicine and develop social medicine to improve the quality and efficiency of existing health services in the country. Maternal and child health staff should be strengthened and reorganized both at the Centre and in the provinces.

A point stressed alike in lectures and discussions was the close relation between nutrition, education, environmental hygiene (including housing and sanitation) and all the factors influencing the standard living in the total frame of mother and child care. Active co-operation at every level is therefore recommended between departments of health, education, agriculture, social welfare, labour and between official and voluntary organizations.

The symposium recommended the development of existing dispensaries into comprehensive health centres providing care and treatment for the health needs of the whole family. All administrative officers were required to take more interest in the health and welfare of people particularly in rural areas. To make service outside the towns more attractive, nine minimum conditions of employment for workers were laid down including a rural allowance of not less than 25 per cent of basic salary, free furnished accommodation, and special facilities for transport, children's education etc.

More adequate equipment and supplies for existing public services were recommended to enable them to function more efficiently.

PERSONNEL TRAINING—Concerning personnel training the experts recommended that increased importance be given to field work, that personnel in different branches be trained together to promote the habit of team-work, that child care and the treatment of children's diseases be given equal importance with other branches of training and that mental health be included in all medical and nursing courses. Standards of training for prasava sevikas (midwives) and or hereditary dias were also recommended by the symposium.

During the four-day session, lectures were given by experts on administration of maternal and child health programme, nutrition of children, co-ordination of social and health services, care of infants and toddlers, common diseases of children, care of school age child, and personnel needs and personnel preparation. —(P.T.I.).

APPLICATION OF ATOMIC ENERGY FOR BIOLOGICAL STUDIES

Dr. Irene Juliot-Curie, Nobel laureate of France, and the daughter of the celebrated Curies told a vast audience at the Indian Science Congress, Poona, on Jan. 3, 1950, "It is not the military nor even the industrial value of atomic energy that stands in bright prospect. The immediate use of nuclear energy lies in its application to medicine and biology."

Dr. Irene was speaking on Radio-activity (emission of nuclear particles by radium and other radio-active elements). She said, modern atom-splitting machines like the Cyclotron and the atomic pile had helped the scientists in the creation of over 700 "Radio-Isotopes" of various elements. These isotopes, Dr. Juliot-Curie added, were now increasingly used in the treatment of cancer and other diseases, thus alleviating the sufferings of humanity to a great extent.

The distinguished French physicist desired every country in the world to have its own atom-pile "not for dreadful and destructive purposes but for the production of these life-giving isotopes."

ATOM BOMB & ITS USE ON HIROSHIMA

Dr. Compton, one of the senior members of the American Committee of Scientists charged with the production of the atom bomb, revealed to a gathering of scientists on Jan. 4, 1950, the "exciting" and yet—in the words of Prof. P. C. Mahalanobis, President of the Indian Science Congress—"a story which filled him with awe," of the search for the atom bomb and the decision to use it.

Once the bomb was ready, Dr. Compton said, the questions that faced American scientists, politicians and others was "how to use it" or "not use it at all". Dr. Compton referred to a talk he had at that time with the then Secretary of State, Mr. Stimson, who told him that in arriving at a decision "we must think not in terms of the life of United States but of humanity".

Two considerations that went against the use of the bomb, Dr. Compton said, were that if they used the bomb, the U.S. could not later say "outlaw the bomb." Besides, they would have to answer the charge of "ruthlessness that marked the conduct of the war by American using the destructive atom bomb" that was to come from some quarters.

But at the same time, the military had warned that even if they did not use the bomb, it was not possible to keep it a secret.

"In the eventuality of another war," Dr. Compton said "the atom bomb, even if not used by America, would have formed a part of the arsenal of many nations of the world."

FATEFUL DECISION—Dr. Compton said the main consideration however that led to the "fateful" decision, was the anxiety to bring the war to a speedy end and thus save the lives of millions of American and Japanese soldiers.

If the atomb bomb had not been used the only other way to end the war was to invade Japan and capture it. But that, according to Dr. Compton, would have meant the loss of lives of at least half a million of American soldiers and a few million of Japanese.

The same feelings excited the minds of administrators and those connected with defence were also to be found, Dr. Compton said, amongst the workers at the laboratories where the bomb was being prepared. "I talked to scientific men and workers at these laboratories. Many of them said 'it is not a humane thing for us to do.' But the majority said 'we must do it because we cannot go on fighting the war indefinitely.'"

Two weeks later Dr. Compton said, the atom bomb fell. "Only history could say whether our choice was right. But some relief came to us two months later when the boys came back. The glow on their faces at the relief of the end of the war filled our hearts with warmth."

Story behind the Atom Bomb—Dr. Compton began his 'story' by giving an account of the study of nuclear physics which led to the discovery of nuclear fission. Just as the war clouds were gathering in 1939, he said, the world came to know that a "chain atomic reaction," with the consequent release of a huge amount of energy was possible through the publication of the work of Prof. Frederick Juliot and his collaborators in France. By that time already secrecy was being maintained in the work that was carried on in the laboratories studying atomic problems.

In the summer 1940, experiments had started in Germany for study of atomic energy for possible use in warfare, and atomic energy then assumed more and more military aspect. In U.S.A., a committee was formed by the National Academy of Sciences under the chairmanship of Dr. Compton to assess the possibility of using atomic energy in war.

"We know," Dr. Compton said, "the Germans had been working for two years on the problem and must have made progress. If the atomic bomb could be made, we should know how to make it first for we had realised that its destructive power was so great that it would mean difference between victory and defeat."

On Dec. 6, 1941, a day before the Pearl Harbour, Dr. Compton said, he and his collaborators received instructions from Washingtom 'to go ahead' with their programme.

The task was a heavy one, Dr. Compton said. By Nov. 1942 the necessary materials were in their hands and on Dec. 2, 1942 "a day I shall never forget" they had succeeded in their experiments.

"The atom bomb had become possible and you could see reflected in the faces of those in the laboratory the questions—is it going to be used and what will humanity say of us in that eventuality."

Dr. Compton, reminded his audience that in the long run there were immense possibilities of atomic energy being used for the progress of humanity. "What we learnt most during the efforts to release atomic energy was the value of co-operation and how it is possible for people to make their common choice for a common goal. There was worldwide co-operation in the release of atomic energy."

Dr. Compton added: "We in the U.S.A., India and other nations represented at the gathering are faced with great problems. Our ways of their solution might differ but the central goal is the development of men, women and children so that they will be of value to themselves and others. We shall use the progress of science, industry and in other fields for that purpose." —P.T.I.

ASSESSMENT OF HEALTH AND FITNESS

"In spite of unprecedented efflorescence of knowledge on physiology and medicine within the last hundred years, we do not as yet know how to categorise apparently healthy persons in different grades of positive health," said Dr. K. Mitra, Nutrition adviser to the Government of India, presiding over the Physiological Section of the Indian Science Congress, Poona on Jan. 4, 1950.

He said: "The medical undergraduates are taught almost next to nothing on the technique for measurement of health levels. In a spate of specialisa-

tion on the physiology of each of the different components of the body, the fundamental fact has been overlooked that the human organism is an integrated whole and not simply a conglomeration of tissues, fluids and organs. He felt that the incidence of lowered state of health in mass scale caused as a result of the two world wars and the economic depression of thirties had brought into the forefront the necessity of establishing limits of the different grades of health or fitness and also the yardsticks that might be used for such assessment with reasonable precision.

In matters of relief, rehabilitation and rationing the health authorities, he added, had often to assess whether one group of people was in a lowered state of health as compared to others and the yardsticks for such an assessment had to be reliable, easy and quick of application.

"The subject of optimum health and fitness have assumed a national importance today as no state can maintain its integrity and independence unless it can provide efficient and physically fit man power for its agriculture, industries and the defence services," he said.

STUDIES IN NUTRITION—Continuing Dr. Mitra said that the emergence of the concept of 'nutrition' as an individual entity within the recent years and the studies carried out in this connection had helped in adding to their meagre store of knowledge on the physiology of health and fitness of man. The data collected during investigations on the influence of working conditions and environment on the health of labour populations had tended to clarify certain issues in this connection, he added.

Dr. Mitra suggested that as a necessary preliminary for future studies on the physiology of health, the data collected in connection with investigations made in different countries had to be thoroughly scrutinised in order to indicate lines of approach to the problem.

Subsequently planned researches on the phenomenon of health, on national and international basis, the latter probably with the help of World Health Orgaisation had to be sedulously pursued and the departments of hygiene and physiology in the various medical colleges in India should establish effective liaison and collaborate research on this subject of national importance.

The three different phenomena of physique, organic efficiency and motor fitness of the body with their relation to health and well being have probably to be studied in this connection, he added.

In conclusion Dr. Mitra pleaded that pay scales in the scientific and administrative services should be closely equated to ensure recruitment of top ranking university students in both of them instead of to the one in preference to the other.—U.P.I.

CORRESPONDENCE

The Editor is not responsible for any views expressed by contributors

IMPROVING THE STANDARD OF MEDICAL AID IN INDIA

Sir,—The standard of medical aid provided by the Government today is low due mainly to the lack of funds. I have laid down the following lines as a humble suggestion, which if given a practical shape, is bound to prove useful. The out-line of the scheme is as under:—

Although majority of the population in India can not afford to have costly medical aid, a great majority will be fairly willing to pay one rupee as charity fund per individual patient. If all the new patients in out-patient department are asked to do this, a fairly sufficient collection of money can be done, which will releive the burden of expenditure on the government to a considerable extent. The government servants and 20 per cent of the deserving public members may be exempted from this subscription.

For instance in an average dispensary, where the average daily attendance in the out-patients department is 50, at least 10-20 patients are new. In this case one rupee per new patient will yield a monthly income of at least 300/- rupees and a yearly income 3,600/- rupees.

In an average well-equipped big hospital, which provides medical aid to some 200 patients daily in the out-patients department, the average number of new patients is between 50 and 100. Similarly this can yield a monthly income of at least 1,500/- rupees and a yearly income of at least 18,000/- rupees.

General ward patients may be charged as below:—

Government servants and upto 50 per cent of the deserving public members with a monthly income of upto Rs. 150/- per month may be admitted free of charge.

Those with an income of Rs. 151/- to Rs. 300/- per month—Rs. 5 only as admission fee.

Those with an income of Rs. 301/- and above—Rs. 10/- only as admission fee.

The average expenditure of a dispensary, which has a daily attendance of about 50 in the out-patients department is Rs. 5,000/- per annum inclusive of the pay of the staff against a yield of Rs. 3,500/-. This means that there will be some 60 per cent saving in the present budget expenditure.

The amount thus collected may be utilized for the following purpose:—

(*a*) Better equipment of the units of medical aid with medicines, instruments, laboratory and X-ray plants.

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(*b*) Training of employed doctors in special branches of medicine and surgery, laboratory and X-ray.

(*c*) Employment of more medical personnel and opening of new dispensaries.

(*d*) Improvement in the present scales of pay of all medical staff with due consideration to their standard of living under modern conditions. This will also serve as a step to minimise corrupt practice. Lastly I seek your comment on the scheme.—I am, etc.

OM PARKASH.

28.9.49.
1/C, Civil Dispensary,
Kotkhai Dist., Simla,
East Punjab.

PAIN IN A RARE FORM

Sir,—A boy aged 10 years came for the treatment of pain.

The pain was in paroxysmal, intense, splitting, tearing, piercing, twisting and breaking form, all over the body. During an attack he used to toss, shout, bend, crawl, cry, twist, tremble, rapidly breathe, produce lock jaw and sometimes pass urine and stools unconsciously. He used to have these symptoms several times a day and had suffered continually for complete four months.

When there was no pain in between the attacks he was eating, drinking laughing, walking, playing and forgetting all the pasts and felt quite well.

Treatment during these 4 months was given to him by some doctors elsewhere.

It was said to have consisted of some 6 pain killing injections, analgesic mixtures, purgatives, analgesic tablets and other domestic and herbal medicines including the Ayurvedic and Homoeopathic ones. Externally some liniments and balms were used. But all these failed *in toto* to relieve him of the troubles.

The only treatment which used to give him some relief was the pouring of several bucketfuls of cold water over his body during the paroxysm but during non-paroxysmal period this sort of cold bath was repelling.

On examination I found the following conditions:

(*a*) fair health, (*b*) moderate anæmia, (*c*) intelligent look, (*d*) jolly mood, (*e*) tonsils moderately enlarged, (*f*) round worms suspected, (*g*) bowels used to move freely, (*h*) liver and spleen normal, (*i*) heart and lungs N.A.D., (*j*) no signs or symptoms of congenital or acquired syphilis, (*k*) neither sweating nor any joint pain and (*l*) parents healthy. No pathological examination could be done.

Treatment given by me was—

(*a*) mist. soda salicylas t.d.s., 6 doses.

(*b*) Berin 1 mg. 6 tab. 1 t.d.s., only 6 doses.

Points of interest are:

(*a*) No definite diagnosis could be arrived at.

(*b*) Whether sodisalicylas or Berin or both of them could give him the relief.

(*c*) This treatment gave him instantaneous relief just like a *magic*, and he has not yet suffered from any of those symptoms for the last 2 years.

Now it is for the readers to judge what the case may be.—I am, etc.

DR. D. R. YADAVA.

29-9-49.
Samastipur, Darbhanga,
Bihar,

INTERNATIONAL SOCIETY OF INTERNAL MEDICINE

Sir,—A year ago the representatives of 19 countries met in Basle to discuss the creation of an international Society of Internal Medicine, discussions which on the 27th of September led to the foundation of the said society.

Since then the committee of the Society has taken up contact with more countries still and in accordance with a decision taken at the foundation meeting it was decided that a first international congress should be held in Paris from September 11th to 14th 1950. There will be quite a number of papers read, the main communications lasting 30 minutes, others 15 minutes. We should feel very honoured indeed if some outstanding Indian colleagues accepted to take part at the congress and if at least one of them was willing to read a paper. That is why I take the liberty to call upon you and to ask you whether you would have the kindness to give us the names and addresses of colleagues from Bombay, Calcutta and perhaps from some further places, whom we might get into touch with. I am sure that you could also give us some valuable advice as to how we should proceed to get Indian members for our Society.

I shall be most thankful to you for all you will be able to do for our Society and its first international congress and beg you to believe me,—I am, etc.

PROF. A. GIGON.

Basle, Nov., 17th 1949,
Hebelstrasse 1.

REVIEWS

DOCUMENT OPHTHALMOLOGICA, ADVANCES IN OPHTHALMOLOGY—Edited by F. P. Utrecht, A. J. Schaeffer, Los Angeles, Arnold Sorsby, London, Vol. II, pp. 462. Published by Dr. W. Junk, The Hague, Netherlands. Price $4·.

The second volume of Documenta Ophthalmologica, comprising 8 original contributions by investigators in different subjects of ophthalmic interests, has been published by a strong editorial board of ophthalmologists of international repute from different parts of the world.

The first article by G. Wald is in memoriam of Prof. Selig Hecht of Columbia University, who died on September 1947. Hecht is very well known for his work in vision, which is not only a very comprehensive but also highly original contribution since Helmholtz.

There are seven scientific papers, the first one by A. V. Tschermak-Seysenegg from Physiologic Institute of Prague written in German language on studies in physiologic optics.

In about 90 pages, the writer has dealt with the subject of function of contrast and its measurement and on vision in polarized light. He has described the spectrum in terms of wave length and has given a formula for a double index for wave-length and oscillation frequency. In this interesting paper, the author has dealt on sensorial fusion in Alleltrophy as foundation of spectroscopy and devised an instrument named Alleltrop for testing the sensorial fusion. The paper concludes with a discussion on the absolute vertical localisation of entoptic and exoptic impressions and on the particular forms of the phenomenon of interior contrast.

The second paper is one on the physiological optics of the visualisation of x-ray pictures by W. Bronkhorst, Bilthoven, J. Ten Doesschate and F. P. Fischer, Utrecht.

The authors in their work has analysed the relation between the transilluminated x-ray picture and the subjective visual image of the observer with a detailed description of the successive steps of photographic image, retinal image and visual image. The significance of visual acuity is stressed and the close connection between visual acuity and differential sensitivity is shown. They concluded their observations with some remarks of practical importance, *i.e.* maintenance of the optimum brightness of the viewing box and the surroundings, optimum distance of observation, elimination of glare source, colour of the viewing box etc.

The third paper is on the clinical measurement of the frequency of the fusion by R. Weekes and F. Roussel is written in French. In it they have emphasized the importance of frequency fusion measurement in cases of detachment of retina before surgical intervention in tobacco amblyopia and in early stages of glaucoma. The authors have noticed its usefulness in lesions of intracranial optic pathways and concludes that whilst perimetry delineates the defect and hence a method of choice when a scotoma is small and dense, the measurement of frequency of fusion serves to determine the density of the lesion and is a useful test when the defects are extensive.

J. Ten Doesschate and F. P. Fischer of Utreot have written in German on the mechanical properties of the eye and its tissues. Here they have discussed the significance of mechanical properties of a healthy eye as well as that of the diseased eye. The study includes separate description of the function and structure of vascular and nonvascular tissues and also as a whole in both normal and diseased eye.

The next two articles are by Gosta Karpe of Stockholm—the first one is on the apparatus and method of clinical recording of the electroretinogram and the other on early diagnosis of siderosis retinae by the use of electroretinography. In the former, Karpe has described his own instrument which he has himself designed in collaboration with Dr. R. Elmquist. In the latter he has recorded the electroretinagrams in 6 cases, showing various stages of the development of siderosis and concludes that this test gives useful information when a decision has to be made as to the advisability of undertaking a dangerous operation for the extraction of a foreign body.

This volume could be recommended to those who are interested in advanced knowledge of ophthalmology and as a reference volume in libraries.

B. N. Bhaduri.

CURRENT MEDICAL LITERATURE

Blood Pressure Variations in Diabetes Mellitus

Chakravorty (*Indian Heart J.*, 1:101, 1949) gives in following lines the summary of his observations:

A survey was made of the works done in Europe and other countries in connection with the cardiovascular status of a diabetic and the leading views on the subject, upto date, have been grouped, arranged and presented in a comprehensive and classified form. There is every reason to believe that in so doing not a single valuable observation or view has been left out.

Blood pressure variations of 100 diabetic subjects have been studied for the first time in Bengal. Non-diabetic patients suffering from various tropical diseases served as control and the blood pressure values of normal and healthy persons, given by Chopra et al were taken as the standard for such a study. It was observed that

(*i*) Hypertension in diabetes is fairly common, the incidence being 41 per cent.

(*ii*) Diabetics past the middle age develop hypertension much readily compared to normal persons or those suffering from tropical diseases. Further, in diabetics showing hypertension, arteriosclerosis is almost a regular feature and kidney involvement of the nature of nephritis is rare. With the clinical improvement of diabetes in these cases, the blood pressure remains steady or shows a tendency to rise still further.

(*iii*) Young diabetics, on the other hand, usually manifest hypotension compared to control or normal series. In them, with clinical improvement and fall in blood sugar level, the blood pressure slowly rises from hypotension and comes upto normal level. Further, arteriosclerosis was found to be uncommon in young diabetics.

(*iv*) Cardiac manifestations are infrequent and insignificant in diabetic cases.

(*v*) The view that diabetes and hypertension are only stages of the same metabolic disorder have been referred and possible explanations have been discussed. It has been suggested, that diabetes may cause hypertension through increased production of angiotonin-like substances or through a diminished presence of hypertensinases.

Splenomegaly in Congestive Heart Failure

Wahi and Mathur (*Indian Heart J.*, 1:230, 1949) write that the spleen on the average is increased above the normal weight in congestive heart failure.

In 22·2 per cent cases of uncomplicated congestive failure, the spleen was large enough to be theoretically palpable *i.e.*, 300 gms.

In a clinical study of 690 cases of congestive heart failure, the spleen was found palpable only in 7·4 per cent of cases. This means that only one third of theoretically palpable spleens is actually felt clinically.

Greatest percentage of clinically palpable spleens are found in cases of subacute bacterial endocarditis.

Duration of congestive heart failure does not appreciably influence the size of the spleen clinically and weight of the spleen at autopsy.

In 6·4 per cent of cases of congestive heart failure the liver was large enough to be theoretically palpable. However in a clinical study of 690 cases, the liver was reported clinically palpable in 61 per cent cases. This means that more livers are reported clinically palpable than are actually enlarged.

The spleen on the average shows greater enlargement by weight than does the average liver in cardiac decompensation, but clinically the finding is just the reverse i.e., the liver is palpable in a comparatively larger number of cases than the spleen.

Histological studies suggest that splenic enlargement is due to congestion of the spleen which later on may be aggravated by the onset of portal hypertension.

Coronary Heart Disease in India

Vakil (*Indian Heart J.*, · :201, 1949) gives in the following lines the summary of his observation on the study of coronary heart disease in India:

Of a total of 1,860 cases of "organic cardiovascular disease" (from a total medical in-patient population of 30,104 patients) admitted at the K.E.M. Hospital, Bombay, during the five-year period from 1941 to 1945 inclusive, there were 250 cases of coronary artery disease. The incidence of coronary disease was, therefore, 13·5 per cent of all "heart" cases and 0·83 per cent of all "medical" cases of the Hospital. 68·4 per cent of the coronary cases were complicated by hypertension.

Of the 250 coronary cases, 115 cases (or 46 per cent) were examples of coronary occlusion and 106 cases (or 42·4 per cent) were examples of angina pectoris.

The incidence of the coronary group (as a whole) was investigated from the points of view of age, sex and racial factors. 16·4 per cent of our cases were under 40 years of age, 48 per cent were over the age of 50 years whilst 62 per cent of all cases belonged to the fifth and sixth decades of life. From the results of the study, it is probable that "coronary disease makes its appearance earlier in life and attains the peak about a decade earlier in Indian subjects."

Of the 250 cases, 89·6 per cent (224 cases) were males and (26 cases) females. The incidence of females were relatively higher at both extremes of life.

55·6 per cent of cases were Hindoos, 17·8 per cent Muslims, 18·4 per cent Christian and 8 per cent "others'. The incidence of coronary disease was found to be relatively higher in the minority communities of India.

The mortality rate for the whole group was 29·2 per cent, for males 27·7 per cent and for females 42·3 per cent. The death-rate was much higher in the "old age" group.

115 cases of "acute coronary occlusion" were subjected to a careful statistical enquiry.

56·4 per cent of cases were under the age of 50 years, 19·2 per cent were over the age of 60 years and only 16·4 per cent were under the age of 40 years. The "peak' of incidence was noted in the age-group of 40 to 59 years (*i.e.*, about a decade earlier than reported in Western statistics). The average age for the group was 49·4 years and the range, from 7½ years to 78 years.

The ratio of males to females was 90·4 per cent to 9·6 per cent. The incidence of females was higher at the extremes of age.

Seasonal variations, in the incidence of acute coronary attacks, were then investigated.

53·1 per cent of our cases were hypertensive. The incidence of hypertension was much higher in the older age-

groups and in female patients (72·7 per cent incidence to the 50·9 per cent of males).

Cardiac insufficiently was noted in 68·3 per cent of cases (left ventricular failure in 47·4 per cent and mixed failure or right ventricular in 20·9 per cent).

The percentage incidence of other complications and associated aetiological factors (*e.g.* hypertension, diabetes, syphilis and obesity) was then worked out and tabulated.

The death-rate for the group was 33·9 per cent, 45·5 per cent for females and 32·7 per cent for males. The influence of age and sex-factors and of accompanying hypertension were then investigated.

106 cases of angina pectoris were subjected to a statistical enquiry. 59·4 per cent of cases were between the ages of 40 and 59 years, 15·1 per cent were under the age of 40 years and 27·5 per cent over the age of 60 years. The average age for the series was 50·5 years.

89 per cent of cases were males and 11 per cent females. There was a relatively higher proportion of females at the extremes of life.

Hypertension was noted in 79·2 per cent of all cases, in 82 per cent of males and 58·3 per cent of females. The incidence of hypertension was much higher in the older age-groups.

Cardiac insufficiency was noted in 31·3 per cent of cases. The incidence of other complications and associated aetiological factors was, then worked out.

The death-rate for the group was 25·5 per cent, for males 24·5 per cent and for females 33·3 per cent. Higher death-rates were noted at the extremes of life.

In view of the small number of cases, the miscellaneous group of coronary disease was not subjected to a statistical enquiry.

Testosterone in Angina Pectoris

Vakil (*Indian M. Gas.*, **84**:83, 1949) from an analysis of the results of testosterone propionate therapy in 125 cases of 'proved' angina pectoris gives the following summary of his observations: (1) Of the 125 cases of angina pectoris, so treated, 42 were markedly improved, 52 moderately improved and 31 not improved at all. (2) The response to treatment when reported was usually more dramatic in cases of 'post-thrombotic' or 'secondary' angina than in 'primary' angina. (3) A complete although temporary cessation of anginal attacks, after testosterone therapy was noted in 33·6 per cent of the cases, a reduction in the frequency of anginal attacks in 75·2 per cent, a diminution in the intensity of attacks in 77·4 per cent, an increased capacity for effort in 76 per cent, improved exercise tolerance in 60 per cent and electrocardiographic improvement in 10 per cent. (4) After a statistical analysis of 376 cases of angina pectoris treated with testosterone (and including his own), reported in the literature up to date, the writer finds that 'improvement' has been reported in as many as 80·3 per cent of the cases.

Although not enough cases have been reported as yet to permit full evaluation of the efficacy of testosterone propionate in the treatment of angina pectoris, the clinical results so far noted by others as well as by the writer indicate that testosterone preparations are well worth a more extensive trial in cases of this type.

It must be emphasized, however, that treatment of angina pectoris with testosterone propionate is, by no means, a substitute for reasonable or restricted mode of life and light diet, both of which remain fundamental to improvement. Nor can one expect it to supersede the nitrites and other remedies when these are indicated.

Obviously testosterone preparations have a definite place in the treatment of angina pectoris and other coronary disorders.

Low Sodium Diet in Hypertension

Schroeder and others (*J.A.M.A.*, **140**:458, 1949) write that twenty-two patients with hypertension were placed on diets low in sodium chloride in the hospital in an attempt to evaluate the effects of such diets on the levels of their blood pressure. The effects of hospitalization and psychotherapeutic influences were controlled so far as possible.

In 13 patients, most of whom exhibited the disease in its severer stages, the response to salt restriction was poor. Three additional patients with milder forms of the disease manifested a lower level of diastolic pressure; in 1 of these the change which occurred was not reversed by addition of salt to the diet.

A group of 6 female patients are described who exhibited obesity of a characteristic distribution, and some but not all of the signs of Cushing's syndrome. In these, levels of blood pressure appeared to be directly related to the intake of sodium chloride, being lower when salt was restricted and higher when it was added. These patients probably suffer from a disturbance of which arterial hypertension is only one manifestation. It is suggested that there is an alteration of some of the functions of the adrenal cortex in such persons. In general, when the disease was relatively advanced and treatment was mandatory neither restriction of salt nor the rice diet appeared to be of much benefit.

Syndrome of Salt Depletion

Soloff and Zatuchni (*J.A.M.A.*, **139**:1137, 1949) report briefly seven cases that demonstrate some of the untoward effects, including 4 fatalities, which may occur in cardaic patients subjected to a regimen of sodium restriction and sodium diuresis. The blood urea nitrogen was determined in 7 patients, the blood chlorides in 6 patients and the blood sodium in 1 patient while the phenomena of congestive heart failure were present and while this regimen was still being used.

The blood chloride and the blood sodium were reduced and the blood urea nitrogen was elevated in each instance. Some of the mechanisms which may produce these untoward effects are discussed. The great advance in the therapy of heart disease by the introduction of a regimen of sodium diuresis is emphasized, but the importance of individualizing this therapy and of being alert to the possibility of the patient's having passed from the therapeutic to the toxic stage of this therapy is particularly stressed.

Management of Parkinsonism

The general management of these cases is probably still as important as the particular drugs used. Denny-Brown (Disease of the Basal Ganglia and Subthalamic Nuclei, New York, 1946) reminds us that the patient expends much more energy than the normal person on the simplest of actions; for him true rest is impossible save in sleep. His strength must be husbanded for essential purposes, and though regular exercise is necessary it should be distributed over all joints

and not confined to walking. Light massage may be beneficial, but deep massage or electrical treatment is contra-indicated. Acccording to HALL (*Lancet*, 1:193, 1943) a suitable brace is occasionally of value to those whose posture encourages festination, and he also noted that such people often find riding a bicycle easier than walking. One of his patients preferred to take his meals at night, when rigidity tends to be less severe. The patient should be helped to adopt a healthy mental attitude to his disorder, and encouraged to continue in some form of employment for as long as possible. His ability to cope with his symptoms is largely determined by psychological factors, and the superimposed affective disorders can often be overcome by attention to the details of his general life. Whether these patients should be encouraged to mix with one another is questionable; in what is typically a slowly progressive disorder the disadvantages of such society may heavily outweigh its benefits.

The action of hyoscine in lessening parkinsonian rigidity, first noticed it is said, by GNAUCK in 1882, is shared by all the solanaceous drugs. Unfortunately their mode of action is as yet unknown. Preparations of hyoscine or stramonium are usually preferred to atropine or hyoscyamus because the latter have a longer-lasting effect on accommodation. Special preparations made from Bulgarian belladonna seem to have been convincingly shown to possess no advantages over active pharmacopoeial preparations. Patients with paralysis agitans, being older, tolerate such drugs much less readily than post-encephalitics, in many of whom the dosage can with advantage be pushed far beyond pharmacopoeial limits. Paresis of accomodation (causing dimness of vision) and dryness of the mouth can be reduced with eserine eye-drops, special lenses, and the addition of pilocarpine nitrate; but dizziness, headache, mental confusion, diarrhoea, and urinary retention are toxic symptoms which indicate that the limits of tolerance have been passed. Amphetamine in suitable dosage will sometime diminish rigidity, check oculogyric crises, and improve the mental state, though its effects are rarly striking. It is more important to ensure sufficient sleep, and for this barbiturates are often called for. In the last two years much has been heard of an entirely new compound, 'Parpanit,' a substance closely related to antispasmodics such as 'Transentin' and 'Dolantin'; it has atropine-like action, though we do not know how it works in parkinsonism. DUNHAM and EDWARDS (*Lancet*, 2:728, 1948) after a careful assessment of its value, concluded that its activity and side-effects are somewhat similar to those of the solanaceous drugs. The new preparation may help when older remedies are not well tolerated, but in most cases nothing would be gained by abandoning the solanceous drugs. More recently RYAN AND SPURWAY WOO (*Lancet*, 1:258, 1949) have reported favourably on 'Benadryl' in parkinsonism. They treated some 40 cases with 50 mg. three to four times daily, and none showed any toxic effects apart from sleepiness in the first fortnight, though 2 patients had taken such doses for over eighteen months. Rigidity was consistently improved and muscular cramps rapidly abolished, though tremor and oculogyric crises responded poorly. The remark that benadryl, though effective when given alone, can be used in conjunction with solanaceous preparation. A correspondent reported less happy experience; but it seems at least that the anti-histamine drugs deserve an extensive trial in this disease.

Surgical relief of tremor, which often does not respond well to medical measures, has been considered. The various procedures have been discussed by BUCY (*Res. publ. Ass. nerv. ment Dis.*, 21:551, 1942), KLEMME (*Ibid.*, 1596) and others. In brief BUCY recommended extirpation of the precentral cortex, including both areas 4 and 6 of Brodmann, though he was reluctant to attack the "arm area" of the dominant cortex, because a complete though temporary expressive aphasia resulted. MEYERS (*Ibid*, p. 692) found removal of the head of the caudate nucleus beneficial, and section of the lateral pyramidal tract in the cervical cord, as described by PUTNAM (*Ibid*, p. 666), reduced tremor considerably without producing much weakness in the limbs. This last procedure has the advantage of avoiding cortical extirpation with all its attendant risks. But seven years have elapsed since this report was published, and it seems that most neurosurgeons on both sides of the Atlantic do not regard the procedures with much enthusiasm. None of them is entirely satisfactory, and since in general they are only suitable for young patients with a disabling tremor largely confined to one side, it is fair to say that surgery still cannot benefit most cases.

It is too early to claim that great advances in the treatment of parkinsonism are being made. We are still ignorant of how the older remedies act, and we may not get much further until we learn more about the disorders of function which characterise these complaints. It rests with us to make the position clear to patients with parkinsonism, so as to save them needless disappointment; but a great deal can be done for them by studying the details of their management.—*Lancet*, 1:572, 1949.

Comparative Study of Iodine Absorption of Anayodin, Chiniofon, Diodoquin and Vioform in Man

KNIGHT AND MILLER (*Ann. Int. Med.*, 30:1180, 1949) give in the following lines the summary of their observations:

Blood iodine studies were conducted on 36 patients who were receiving treatment for amœbiasis. Eight patients were given Anayodin with a total of 33 determinations being made. Seven patients received Chiniofon with 27 tests being made. On eight patients receiving Vioform, 31 tests were made. Thirteen patients received Diodoquin as treatment and 49 tests were made. Since these tests were all done in duplicate in order to minimize error, this represents a total of 280 blood iodine determinations.

All of the oxyquinoline drugs used in man as amœbacides are to some extent absorbed as measured by blood iodine.

When considered in terms of milligrams of iodine given, Vioform shows the greatest absorption, Diodoquin second, and Anayodin or Chiniofon the smallest.

When given in the recommended therapeutic dosage, Diodoquin gives the highest blood iodine value, Vioform second, and Anayodin or Chiniofon the lowest level.

These drugs appear to reach a peak of blood concentration not later than the seventh day and do not appear to be cumulative in absorption or toxicity.

If therapeutic value is dependent on iodine absorption, Diodoquin, Vioform, and Anayodin or Chiniofon would rank in the order given in therapeutic effectiveness.

Certain factors which may influence absorbability are considered.

The question is raised concerning the effectiveness of these drugs in Endamœba histolytica infection at points other than in the immediate bowel lumen.

Chloroquine in Malaria

Chaudhuri and others (*Indian J. Malariology*, **2**:1, 1948) write that fifty patients with active malarial infection were treated with chloroquine in the Carmichael Hospital, Calcutta. Eighteen had *P. falciparum*, 27 *P. vivax*, 1 *P. malariae*, and 4 mixed *P. vivax* and *P. falciparum* infections. The drug was given in tablet form, each tablet containing 0·25 gm. of the base. Some patients received two tablets as the first dose, another tablet after six hours and then one tablet on each of the two following days—five tablets in all. The remaining patients each received a single dose of six tablets. The above are doses for adults. The temperature fell to normal in an average period of 26·8 hours with the first treatment, and 24·9 hours with the second. Asexual parasites disappeared within 35 hours with the first treatment and 25·5 hours with the second. These results were more prompt than those obtained with either quinine, mepacrine or paludrine. Symptoms of toxicity were noted in 5 patients; insomnia (4 cases), gastro-intestinal irritation (1 case), pruritus (3 cases), and pain in the lower abdomen, genitals and thighs (1 case). Gametocytes were apparently unaffected by treatment.

Present Status of Quinacrine (Atabrine) Dermatitis

Schmitt (*Arch. Dermat. & Syph.*, **59**:16, 1949) distinguishes two distinct types of quinacrine (mepacrine) dermatitis: (1) The lichenoid type which is generally recognised, and (2) an eczematoid type which he considers to be ten times as common. This second variety is characterized by patches of closely set, deep-seated miliary vesicles first appearing on the sides of the fingers, and subsequently affecting the wrists, and less frequently the feet, legs, ears, scalp, supra-pubic region and scrotum. While the original eruption tends to heal, a recurrent eczematoid dermatitis may occur months or years afterwards. The recurrent dermatitis is similar in appearance to the original one, and may occur at previously affected sites or elsewhere.

Psychoses Attributable to Quinacrine

Colette and Porot (*Algerie Med.*, Ref. *Trop. Dis. Bull.*, **46**:607, 1949) describe nine cases which came under their personal observation within a period of one year in which the patients developed acute mental derangement after administration of quinacrine (mepacrine) in the therapeutic doses. Five of the patients had a history of some form of mental trouble in the past, melancholia, short or prolonged confusional states, anorexia nervosa or the like. In six of the nine cases malaria could be definitely excluded as a possible contributory cause of the mental derangement. The onset of mental symptoms occurred very shortly after quinacrine treatment, within a week at most, except in one case where mental symptoms did not appear till one month after the ingestion of 3·5 gm. of the drug.

All the patients had maniacal symptoms, accompanied in some cases by a confusional state, often by an anxiety state, at times intense, and sometimes by very painful hallucinations. The symptoms lasted for one to six months except in two cases in which mental symptoms were of only two and ten days' duration, respectively. The ultimate prognosis is good in all cases. There is no specific treatment. Six cases were treated by electro-shock, the best method of calming maniacal agitation. In one case insulin coma was used with success.

The authors consider that quinacrine should be avoided in the treatment of patients with a history of past psychosis, or of patients in a state of mental disequilibrium. A warning is also given against a too hasty diagnosis of malaria, on insufficient grounds.

Drug Allergy

Sherman (*J.A.M.A.*, **140**:447, 1949) writes that most forms of allergy to protein drugs are readily demonstarable by scratch or intracutaneous tests with the causative agent. In allergy to non-protein crystalloid drugs, such tests are rarely helpful. Since the antigenic activity of crystalloid drugs is believed to result from combination with proteins within the body, a few workers have used drug azoproteins as antigens for cutaneous tests, but the results reported have been disappointing. Leftwich reported success in the use of serum of patients receiving full doses of sulfonamide drugs as antigens in intracutaneous tests for the diagnosis of sensitivity to sulfonamide drugs. No confirmation of this work has been published, and Fink, Burton and Wheeler reported negative results from the use of this method in children. The writer has performed this test on patients known to be highly sensitive to sulfadiazine, with uniformly negative results. It is not a reliable criterion of sensitization to sulfonamide drugs. The only type of cutaneous test with non-protein drugs which has proved of diagnostic value is the patch test in contact dermatitis. Frequently the patch test is also helpful in the diagnosis of dermatitis resulting from internal medication, but it is less reliable in such cases, because of the uncertainty of absorption of drugs through the intact skin.

In general the diagnosis of drug allergy depends on a knowledge of the clinical manifestations of sensitivity which may be expected from each drug used. The history of a hereditary tendency to allergic disease is of little aid in diagnosis except of those manifested by asthma, rhinitis and urticaria. Many of the more serious types of drug allegry may be avoided if minor symptoms of sensitization, such as cutaneous rashes and fevers due to drugs, are recognized as such and use of the causative drug is promptly discontinued.

The specificity of drug allergies varies so greatly that it is impossible to predict the results of substitution of a closely related drug for one which has produced a reaction. Some patients react to a whole group of chemically related compounds, while others show a sensitivity specific for one drug of the group. Only a cautious trial with a fraction of the usual dose will give the answer in an individual case.

Likewise, the duration of drug sensitization is exceedingly variable, in some instances lasting for years and in others, especially in sensitization to penicillin, ending within a few weeks. If an acceptable substitute is available, the wisest procedure is to avoid readministration of a drug which has once caused an allergic reaction for an indefinite period. Occasionally strong indications for the use of an important drug may outweigh the history of allergic reactions to previous administration, and cautious trial, starting with a fractional dose, is warranted. In the case of penicillin, such attempts are often successful; with the sulfonamide drugs, the results are less favourable.

While desensitization is often possible with protein compounds, attempts at desensitization with non-protein compounds, are rarely successful and occasionally cause severe reactions. In general substitution of another medication is preferable.

SUPPLEMENT
Journal of the Indian Medical Association

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ASSOCIATION NOTES

GARHWAL BRANCH—At an ordinary meeting of the Garhwal Branch, I.M.A. held on 1-9-1949, at the residence of Dr. Balkishan, M.B.B.S., D.P.H., D.M.O.H., Garhwal, the following resolutions amongst others were passed:—

Resolved that this Garhwal Branch of the Indian Medical Association expresses its extreme sorrow on the death of Dr. K. N. Dhondiyal, retired P.S.M.S., who was the senior most medical man of the district and conveys its sympathy to the bereaved family.

Resolved that the Director of Medical and Public Health Services be requested to inform this association, the condition of Government medical men and Public Health men volunteer to go to Kashmir Medical Mission and if this period would be counted towards service on duty and they would be given T.A. according to the rules in addition to the facilities mentioned in the circular.

Resolved that the officers of medical and public health services who rendered services during the second World War, either in the civil or military capacity and suffered as prisoners of war, or not, their services be counted towards pay, promotion and pension.

Resolved that the past services of medical and public health personnels in foreign Government and of refugees who are now in the medical and public health departments in India may be considered and recorded towards their pay, promotion and pension.

NEGAPATAM BRANCH—The monthly meeting of Negapatam Branch of I.M.A. was held on 24-9-49 at the Government Hospital, Negapatam. 12 members were present. Dr. Mrs. Mathew was "At Home" to the members. After the minutes of the last meeting were read by the Secretary, Dr. S. S. Chariar, the following resolution was carried unanimously:—"This association requests the Government not to give effect to the proposal of the Surgeon-General contained in his letter No. R.69845-II-49, dated 23-8-49 to appoint a separate Medical Officer for vaccination and inoculation of the sea borune passengers at the port of Negapatam as it is detrimental to the interests of the private medical practitioners and infringes on their rights and privileges besides adding to the financial burden of the Government. Further, this association vouchsafes for the regular and correct working of the Emigrant Medical Syndicate, Negapatam, consisting of 13 private medical practitioners of this place started long ago for the specific purpose."

After that, Major Gangatharen, M.B.B.S., of Madras gave an interesting lecture on "Anesthesia in general practice."

TANJORE BRANCH—Minutes of the meeting of the Tanjore District Medical Association, held on 28-8-1949 in the Medical School Buildings, Tanjore:

In the absence of the president, Dr. P. Narayana Rao, the vice-president of the Association, occupied the chair. 32 members attended the meeting.

Report on streptomycin published by the Expert Committee of the W.H.O. was read out to the members for information.

An interesting paper on "X-ray therapy in non-malignant conditions" was read by Dr. V. K. Ranganatham, Trichinopoly.

* * * *

Minutes of meeting of the Tanjore Brach, I.M.A., held on 18-9-49 in the Medical School Buildings with Dr. P. Narayana Rao, Vice-President of the Association in the chair:

An interesting paper on "Streptomycin in the treatment of Tuberculosis" was read by Dr. N. C. Subramaniam, B.A., M.B.B.S., T.D.D., of Tiruchirapalli. He pointed out the usefulness of this drug in selected conditions of tuberculosis and pleaded that this should be used only as an adjunct to other accepted surgical and sanatoria regime. The lecture was followed by a demonstration of x-ray films depicting features before and after treatment with streptomycin.

RAMNAD BRANCH—Minutes of the meeting of the Ramnad Branch of I.M.A., held at the Municipal Hall, Virudunagar, on 29-10-49 with Lt. Col. M. A. Parthasarathy, District Medical Officer in the chair. The Secretary appealed to the doctors present to enrol themselves as members and strengthen the Association.

An exhaustive paper on "Malnutrition in general practice" was read by Dr. S. N. Ganapathi.

The Secretary proposed a vote of thanks to the Municipal Council for permitting them to use the Hall for the meeting to Dr. S. N. Ganapathi for inviting the Association to have its meeting at Virudunagar and for having stood as the Host.

SOUTH ARCOT BRANCH—Minutes of the meeting of the South Arcot Branch, held on 19-11-49 in the premises of the Head Quarters Hospital, Cuddalore, with Dr. S. Sankararama Iyer, M.B.B.S., in the chair:

There was a lecture by Dr. S. Sankararama Iyer on 'Anæmias.'

The lecturer dealt in detail about the classification, aetiology, clinical picture and diagnosis. He emphasised on the importance of haematological findings and gastric analysis before launching on treatment proper. He outlined that transfusion of blood is the only measure to tide over the crisis in severe degrees of anæmia.

The members participated in a lively discussion on points of practical importance. The meeting came to a close with a vote of thanks to the lecturer. The members were entertained at tea by Dr. S. Sankararama Iyer.

COIMBATORE BRANCH—Minutes of the meeting of the Coimbatore District Medical Association, held on 22-9-1949 in the Nurse's Hall of the Head Quarters Hospital, Coimbatore, with Dr. C. Nanjappa, the president, in the chair. Sixty-five members were present:

After tea and reading of the minutes of the last meeting, the Secretary announced amidst cheers that Dr. A. L. Mudaliar has agreed to inaugurate the Silver Jubilee of their Association on the 17th and 18th of March, 1950.

The following two resolutions were passed unanimously:—

1. Resolved unanimously that in view of the highly technical nature of the subject and the terms and expressions of the various branches of medicine, surgery, midwifery, etc., and the impossibility of having equivalent expressions in any other Indian language, the association is of the opinion that the medium of instruction in medical education shall be only in the English language."

2. That in view of the essential nature of the work carried out by doctors and the growing volume of duties, the present supply of petrol is very inadequate even for half the month. Hence the Association requests that immediate orders be passed for the grant of extra supply of petrol as heretofore for medical practitioners.

The following members then demonstrated a few of their interesting cases:—

1. Dr. N. Subramanian—(*a*) Two cases of congenital heart disease; (*b*) Rheumatic heart disease; (*c*) Progressive muscular atrophy; (*d*) Tumour, abdomen.

2. Dr. C. N. Santhanam—(*a*) Glandular enlargements; (*b*) Pernicious anæmia; (*c*) Aneurysm of the abdominal aorta.

3. Dr. C. R. Subbarathnam—(*a*) Meningo-myelitis.

DOHAD BRANCH—Report of the Dohad Branch, I.M.A., for the year 1948-49.

Minutes of the Annual General Meeting of the Dohad Branch, I.M.A., held on 19-9-49 at the Secretary's residence:

The following office-bearers were elected:—(1) *President*—R.B. Dr. A. S. Barot, M.B.B.S. (2) *Secretary & Treasurer*—Dr. H. C. Sheth, M.B.B.S. (3) *Managing Committee*—Drs. U. K. Pathak, D. C. Kadkia and J. M. Dixit. (4) *Member for the Central Council*—Dr. H. C. Sheth.

During the year there were four meetings out of which one was a clinical meeting. It was presided over by Dr. Banuarilal, M.S. of the Railway Hospital.

The subjects discussed were:—

(1) Pleurisy with effusion and congestive cardiac failure. (2) Epithelioma of male genetalia. (3) Cirrhosis of the liver. (4) Rheumatic heart.

MADURA BRANCH—Minutes of meeting held on 17-9-49, in the Erskine Hospital, Mathurai, with Dr. P. Vadamalayan in the chair. About 60 members attended.

Dr. A. Narayana Menon, Dr. A. K. Rajagopalan, Dr. K. Pulasubramaniam, Dr. K. G. Ramabadran, and Dr. K. S. Krishnan paid tributes to Dr. K. Rama Menon, District Medical Officer, Mathurai, on the eve of his transfer to Calicut. They spoke about the qualities of his head and heart and praised his services to the profession, the Association and the public. Dr. P. Vadamalayan, the President, associated himself with the encomiums paid by the members and Dr. Rama Menon, replied thanking the individual members and the Association for the kind sentiments expressed.

At the request of Dr. Miss A. Thomas, the lecture on ectopic pregnancy scheduled for the evening was postponed to a later meeting.

Dr. K. S. Krishnan, Hony., Surgeon, Erskine Hospital, demonstrated the specimen of a huge megacolon he had excised in one stage from a patient aged 35. He gave the signs and symptoms of the case and the conditions that necessitated this resection. The patient, however, after 6 days of comparatively uneventful postoperative period succumbed on the 7th day.

Dr. K. Ramachandran, Dr. K. A. Kalyanam and Dr. T. R. Muthurangam took part in the discussion that followed. The President was of the opinion that the one stage resection of the large bowel was a serious operation with a very high mortality and should not be resorted to.

After a vote of thanks by the Hony. Secretary the members adjourned to the adjacent lawn to see the following films:—

1. Skin Grafting—A demonstration of techniques.
2. Partial gastrectomy for a case of gastro-jejunal ulcer.
3. Perineal prostatectomy.

The films were lent by the courtesy of the United States Information Service, Madras and were appreciated.

* * *

Minutes of the meeting of the Madura Medica Association, held on 29-10-1949 in the Erskine Hospital, Mathurai, with Dr. P. Vadamalayan in the chair. Sixty members attended.

The President introduced Dr. A. Thomas, the lecturer of the evening to the members.

Dr. Miss Thomas then gave a most interesting and instructive lecture on ectopic gestation. She illustrated her lecture with reports of various types of cases met with by her during her medical career and was listened to with rapt attention by the members. She dealt in detail about the classification in general and in the various age groups, the theories about etiology of the condition and also about its pathology. She described in detail about the various modes of the termination of a tubal pregnancy. She enumerated the important points in the diagnosis of the condition and discussed the differential diagnosis. She pointed out the difficulties usually met with in the diagnosis of ectopic pregnancy and illustrated this with actual reports of cases examined and treated by her. Regarding the treatment she said that it was purely surgical and must be resorted to immediately a suspicion as to the diagnosis was made. She also gave comparative statistics from American and Indian literature on the subject.

An interesting discussion followed the lecture. Dr. Umapathy Mudaliar mentioned from his experience the very high incidence of ectopic gestation among the working classes of Calicut. Dr. K. Ramachandran quoted recent literature for leaving the placenta alone in cases where it was not easily removable after an operation for removal of foetus in ectopic gestation. The President in his concluding remarks said that a case with vaginal bleeding combined with pain and evidence of a pelvic haematoma as disclosed by a diagnostic puncture in the posterior fornix must almost always be a case of Ectopic Pregnancy.

After a vote of thanks by the Hony. Secretary the gathering adjourned to the adjacent lawn where the following films were screened:—

1. The story of D.D.T.
2. Your children's ear.
3. The triumph over deafness.

The films which were lent by courtesy of the British Information Services were very instructive and were much appreciated.

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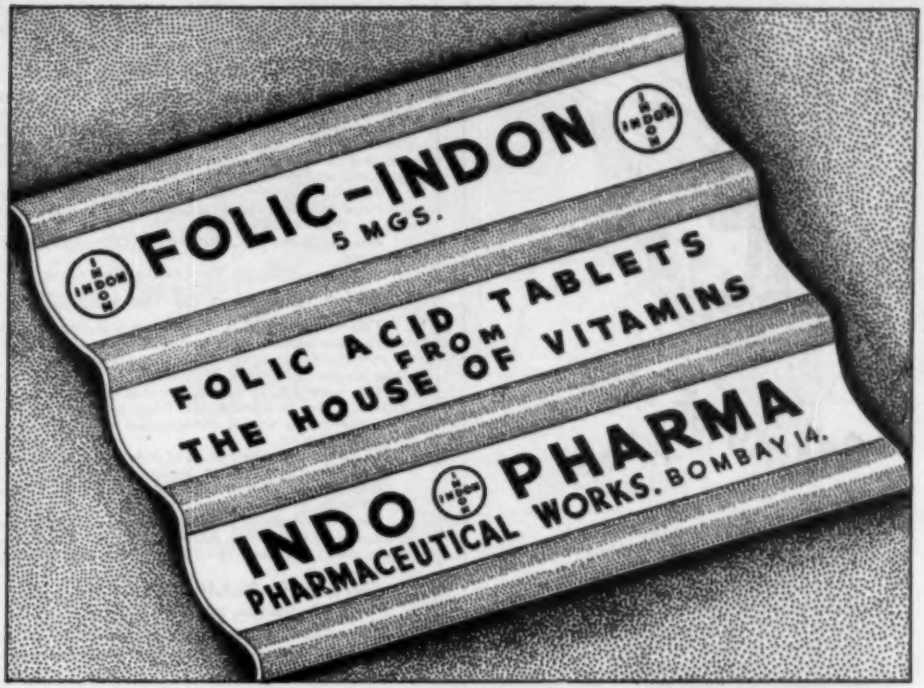
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